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NATIONAL PROGRAM OF INSPECTION OF NON-FEDERAL DAMS, TENNESSEE. --ETC(U)  
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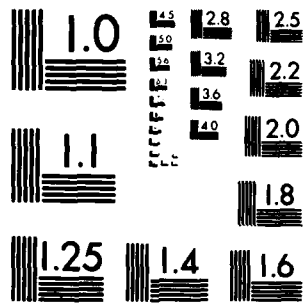
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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The dam is a linear earthen structure 310 feet long and 44.7 feet high with a crest width of 14 feet. The upstream and downstream slopes are 2.6H:1V and 2.5H:1V respectively. The principal spillway consists of a 2' x 6' (ID) concrete riser with a 15" steel cylinder concrete pipe. The reservoir is drained from the base of the riser through a 16" diameter formed opening regulated by a 24" sliding headgate. The emergency spillway is an uncontrolled saddle type excavated in rock with a 16 foot base width. The embankment is free of undesirable vegetation except for some scattered 1/2-2" diameter heavenwood		

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trees. Most of these are at the downstream right toe and abutment tie-in. No signs of sliding, cracking, or differential settlement were observed on the dam or in the area immediately downstream. Erosion was insignificant. On the basis of a federal hazard potential classification of "high" and an "intermediate" size classification, the dam should pass the full probable Maximum Flood (PMF) of 28.5" of rain falling in 6 hours. Analysis reveals that the dam will overtop by about 3.4' for 1.8 hours during this storm. The 1/2 PMF will also overtop the structure. The dam received a condition classification of "significantly deficient" because of its spillway limitations. It is recommended that a qualified engineer be engaged to develop project modifications that will allow the dam to pass the PMF and that the owner perform various maintenance operations.

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**DEPARTMENT OF THE ARMY**  
**NASHVILLE DISTRICT, CORPS OF ENGINEERS**  
**P. O. BOX 1070**  
**NASHVILLE, TENNESSEE 37202**

IN REPLY REFER TO

ORND-G

9 JUN 1981

Honorable Lamar Alexander  
Governor of Tennessee  
Nashville, TN 37219

Dear Governor Alexander:

Furnished herewith is the Phase I Investigation Report on Jennings Creek Watershed Dam No. 15 near North Springs, Tennessee. The report was prepared under the authority and provisions of PL 92-367, the National Dam Inspection Act, dated 8 August 1972.

The report presents details of the field inspection, background information, technical analyses, findings, and recommendations for improving the condition of the dam.

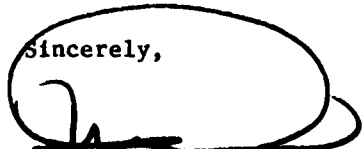
Based upon the inspection and subsequent evaluation, Jennings Creek Watershed Dam No. 15 is classified as significantly deficient due to insufficient storage and spillway capacity to pass the probable maximum flood and excessive growth of trees and brush on the embankment.

The recommendation concerning project modifications to allow safe passage of the design flood and others contained in this report should be undertaken in the near future.

Public release of the report and initiation of public statements fall within your prerogative. However, under provisions of the Freedom of Information Act, the Corps of Engineers is required to respond fully to inquiries on information contained in the report and to make it accessible for review on request.

Your assistance in keeping me informed of any further developments will be appreciated.

Sincerely,

  
LEE W. TUCKER  
Colonel, Corps of Engineers  
Commander

1 Incl  
As stated

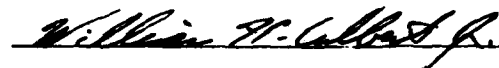
CF:  
Mr. Robert A. Hunt, Director  
Division of Water Resources  
4721 Trousdale Drive  
Nashville, TN 37220

PHASE I REPORT  
NATIONAL DAM SAFETY PROGRAM  
TENNESSEE


Name of Dam ..... Jennings Creek Watershed Dam No. 15  
County ..... Jackson  
Stream ..... Trib. of Jennings Creek at Hudson Hollow  
Date of Inspection ..... January 8, 1981

This investigation and evaluation was prepared by the  
Tennessee Department of Conservation, Division of Water  
Resources


PREPARED BY:

  
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Water Resources Engineer

APPROVED BY:

  
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Chief Engineer  
Safe Dams Section

APPROVED BY:

  
Robert A. Hunt, P.E.  
Director, Division of  
Water Resources  
Tennessee Department of  
Conservation

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## PREFACE

This report is prepared under guidance contained in the Department of the Army, Office of the Chief of Engineers, Recommended Guidelines for Safety Inspection of Dams, for a Phase I investigation. The purpose of the Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In the review of this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. Additional data or data furnished containing incorrect information could alter the findings of this report. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structures and may obscure certain conditions which might be detectable if inspected under the normal operating environment of the structure.

The analyses and recommendations included in this report are related to the hazard classification of the structure at the time of the report. Changes in conditions downstream of the dam may change the hazard classification of the structure. A change in hazard classification may in turn change the design flood on which the hydraulic and hydrologic analyses are based and may have a significant impact on the assessment of the safety of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present conditions of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspections can there be any chance that unsafe conditions will be detected.



Jennings Creek Dam No. 15

Jackson County

April 2, 1981

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
TENNESSEE

Name of Dam ..... Jennings Creek Watershed Dam No. 15  
County ..... Jackson  
Stream ..... Trib. of Jennings Creek at Hudson Hollow  
Date of Inspection ..... January 8, 1981

ABSTRACT

The dam is a linear earthen structure 310 feet long and 44.7 feet high with a crest width of 14 feet. The upstream and downstream slopes are 2.6H:1V and 2.5H:1V respectively.

The principal spillway consists of a 2' x 6' (ID) concrete riser with a 15" steel cylinder concrete pipe. The reservoir is drained from the base of the riser through a 16" diameter formed opening regulated by a 24" sliding head-gate. The emergency spillway is an uncontrolled saddle type excavated in rock with a 16 foot base width.

The embankment is free of undesirable vegetation except for some scattered  $\frac{1}{2}$ -2" diameter heavenwood trees. Most of these are at the downstream right toe and abutment tie-in.)

No signs of sliding, cracking, or differential settlement were observed on the dam or in the area immediately downstream. Erosion was insignificant.

On the basis of a federal hazard potential classification of "high" and an "intermediate" size classification, the dam should pass the full Probable Maximum Flood (PMF) of 28.5" of rain falling in 6 hours. Analysis reveals that the dam will overtop by about 3.4' for 1.8 hours during this storm. The  $\frac{1}{2}$ PMF will also overtop the structure.

The dam received a condition classification of "significantly deficient" because of its spillway limitations.

It is recommended that a qualified engineer be engaged to develop project modifications that will allow the dam to pass the PMF and that the owner perform various maintenance operations.

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
JENNINGS CREEK WATERSHED DAM # 15  
JACKSON COUNTY, TENNESSEE

SECTION 1 - GENERAL

- 1.1 Authority - The Phase I inspection of this dam was conducted under the authority of the Tennessee Code Annotated, Section 70-2501 to 70-2530, "The Safe Dams Act of 1973", in cooperation with the U. S. Army Corps of Engineers under the authority of Public Law 92-367, "The National Dam Inspection Act".
- 1.2 Purpose and Scope - The purpose of a Phase I investigation is to develop an engineering assessment of the general condition of a dam with respect to safety and stability. This is accomplished by conducting a visual inspection, reviewing any available design and construction data, and performing appropriate hydraulic, hydrologic, and other analyses. A comprehensive description of the Phase I investigation program is given in Recommended Guidelines for Safety Inspection of Dams, by the Department of the Army, Chief of Engineers, Washington, D. C. 20314.
- 1.3 Past Inspections - Personnel from the Tennessee Department of Conservation, Division of Water Resources surveyed the dam and conducted a cursory inspection of the site on November 5, 1980. The dam is inspected at least annually by SCS to provide maintenance recommendations for the Watershed District Board.
- 1.4 Details of Inspections - The Phase I visual inspection of Jennings Creek Watershed Dam # 15 was conducted on January 8, 1981. The weather was partly cloudy with a temperature of 25-30°F. Approximately 1" of melting snow was on the ground. Most of the embankment was clear, however, because of its direct exposure to the sun. The southern exposure of the downstream slope kept it even clearer, so the inspection was not significantly hindered because of snow. The reservoir was empty at the time of the inspection at the request of the landowner.

1.5 Inspection Team Members - Field inspection was performed by the following State personnel:

Edmond O'Neill  
Robert Ramsey  
William Culbert, Jr.

The team was accompanied by Al Dunn (Corps of Engineers), Perry Fuqua (SCS), and Jonah Sadler (property owner).

## SECTION 2 - PROJECT DESCRIPTION

- 2.1 Location - Jennings Creek Watershed Dam No. 15 is located in Jackson County, Tennessee, 600 feet north of State Highway 56 and 3,000 feet east of the Macon-Jackson County line. The dam is on the Hudson Hollow tributary of Jennings Creek. It is shown on the U. S. Geologic survey 7.5 minute Willett Quadrangle map at 36°28'19" N latitude and 85°45'30" W longitude. Location maps are provided in Appendix B of this report.
- 2.2 History of Project - The dam was completed in 1961 under the authority of the watershed protection and flood prevention act (Public Law 566). Its primary function is flood control. It is one of a series of dams sponsored by the Jennings Creek Watershed District, the Jackson County Soil Conservation District, the Macon County Soil Conservation District, and the Clay County Soil Conservation District with the assistance by the Soil Conservation Service. Construction was by Ascon, Inc. It is owned by Jonah Sadler.
- The lake was drained in the summer of 1980 to allow installation of a 24" drawdown headgate on the principal spillway riser. The reservoir remains empty at the request of the property owner.
- 2.3 Size and Hazard Classification - The dam is in the intermediate size classification, with a measured height of 44.7'. Reservoir storage is calculated as 31 acre-feet at normal pool and 161 acre-feet at the emergency spillway crest. The dam is classified as high hazard because of the presence of two occupied houses 400 and 800 feet downstream (see photo no. 2).
- 2.4 Description of Dam and Appurtenances
- 2.4.1 Embankment - The embankment is an earthfill structure reportedly constructed using residual clay derived from the in-situ weathering of the underlying bedrock.

The dam is underlain by Mississippian Age and Ordovician Formations of high chert limestone. The bedding planes are mostly horizontal with appreciable cavernous solution zones.

The dam is measured 44.7 feet high and 310 feet long with a crest width of 14 feet. The crest elevation varies from 709.0 feet to 710.4 feet. The downstream and exposed upstream faces of the dam are uniform with slopes of 2.5H:1V and 2.6H:1V respectively. An 8 foot wave berm at the normal pool water surface defines the upper limit of a 2.7H:1V slope extending down to the lake floor.

The design plans specify a cutoff trench, excavated to bedrock (elevation 656) along the centerline of the dam, with 1:1 side slopes and a 10' base width.

- 2.4.2 Service Spillway - The principal spillway maintains Normal Pool at elevation 684.5. It consists of a 2' x 6' (inside diameter) reinforced concrete riser 19' tall, feeding into a 15" AWWA C-301 steel cylinder concrete pipe 242' long (see photo nos. 8 and 12).
- 2.4.3 Emergency Spillway - The emergency spillway is excavated in rock, left of the embankment. The right side slope is 2.4H:1V. The base width is 16' with a crest elevation of 701.0'. The left side slope is effectively 1.6H:1V for 4.7' above the crest, then it extends vertically upward for 11' (see photo nos. 5 and 6). The approach and exit channels are on 6% and 3% slopes respectively.
- 2.4.4 Drawdown Facilities - The drawdown facilities consist of a 16" pipe (invert elevation 668.0) controlled by a 24" slide gate. The gate is manually operated from the top of the riser (see photo nos. 7 and 8).
- 2.5 Downstream Channel - The channel is shallow and poorly defined for several hundred feet downstream of the dam, until it crosses under the highway bridge. In this area, the channel has a base width of approximately 8', a depth of 6', and 2H:1V side slopes. Further downstream, the channel flattens out as it exits from the hollow into the bottomland. It lies on a 2% slope and apparently seldom carries more than a nominal flow as evidenced by its vegetative cover and minor erosion (see photo no. 2).



2.6 Reservoir and Drainage Area - The storage capacity of the reservoir at normal pool elevation 684.5 is 31 acre-feet. The pool area at this elevation is 5.7 acres. The dam crest elevation of 709.0 provides 255 acre-feet of storage with a surface area of 14 acres.

At a 40% average ground slope the basin is unusually steep. The main channel extends most of the length of the longest water course and has no significant tributaries.

The size of the drainage area is 490 acres (0.766 mi<sup>2</sup>). Major soil types in the watershed include Bodine, Mountview, Delrose, Dickson, and Mimosa. The drainage area is mountainous and predominantly wooded.

### SECTION 3 - FINDINGS

#### 3.1 Visual Findings

- 3.1.1 Embankment - The grass cover of the dam is full and uniform over practically the entire surface. The embankment hosts no deleterious vegetative growth other than a few small diameter trees. The side slopes and crest of the dam are uniform with good definition. No signs of cracking, sliding, or differential settlement were observed.
- 3.1.2 Service Spillway - The riser appears to be in excellent condition with no noteworthy cracking or weathering. The drawdown gate and operating mechanisms have been recently installed and appear to be operable (see photo nos. 7 and 8). The drawdown inlet and lake bottom have accumulated little sediment so presumably the spillway culvert is clear also. This cannot be ascertained since the outfall is practically submerged (see photo no. 12). The visible portion of the pipe appears to be in good condition.
- 3.1.3 Emergency Spillway - The emergency spillway is uniform over its entire length. The only noteworthy obstructions are a small copse on the embankment side of the channel near the critical section and some loose rock along the left side of the base. The later obstruction, however, was considered in the hydraulic calculations. No appreciable erosion was observed along the spillway itself, but a gully, approximately 4' deep and 6' wide has eroded off of the right side of the spillway's exit channel tapering away as it reaches the natural stream just downstream of the plunge pool (see photo no. 10).

A small mud slide occurred on the left side slope of the emergency spillway approximately 50' upstream of the critical section. Most of the earth was deposited on the spillway entrance channel near the lip of the natural reservoir basin. The slide was apparently minor because the property owner, Jonah Sadler, was rather unconcerned about any obstruction that may have

occurred. It was removed during replacement of the spillway head gates in the summer of 1980.

- 3.1.4 Downstream Channel - The downstream channel is relatively clear and flat for a few hundred feet downstream of the dam. It is well grassed over most of its surface, showing signs of only minor erosion. This is understandable since the principal spillway can deliver no more than 30 cfs at maximum head. A few hundred feet further downstream the channel flattens out, increases in size, and loses some of its vegetative cover.
- 3.1.5 Reservoir and Drainage Area - The floor of the reservoir is clear of any large trees and debris. Sediment is minimal because the drainage area is 90% wooded.

Since the installation of the new drawdown head-gates, the reservoir remains drained at the owners request. There has been some illicit dynamite fishing in the lake and the owner is concerned about vandalism, as well as the danger of a flood.

- 3.2 Review of Data - Information available for review includes the SCS design drawings and the Watershed Work Plan prepared by Jennings Creek Watershed District, the SCS, and Soil Conservation Districts of Jackson, Clay, and Macon Counties.

The bedrock within the Jennings Creek Watershed consists of formations of Ordovician and Mississippian age. The rock strata has nearly horizontal bedding. The composition of the rock ranges from thin to massive bedded limestone, cherty limestone, shaly limestone, and shale. There are extensive outcrops of bedrock on the steeper slopes with intermittent areas of shallow residual soil overburden. The presence of cherty limestone formations has led to high chert content in the colluvial and alluvial soils and in many of the residual soils. Many solution zones are present in the limestone bedrock. These are in the form of caverns, solution planes, and small sink holes.

The design plans specify a cutoff trench, excavated to bedrock (approximate elevation 656) along the dam centerline, with 1:1 side slopes and a 10' base width.

According to the owner, no grouting was performed on the project.

- 3.3 Static and Seismic Stability - The actual margin of safety for static stability cannot be determined because the engineering data required for an analytical stability analysis are not available. However, an assessment of the embankment stability based on visual evidence and engineering judgment would indicate a stable structure due to moderate embankment slopes and the lack of leaks or seepage. The project is located in Seismic Zone 1, and according to OCE guidelines, should not be expected to be threatened by seismic effects provided static conditions are satisfied.
- 3.4 Hydraulic and Hydrologic Analysis - According to OCE guidelines, the design flood for an intermediate size dam in a high hazard area is the Probable Maximum Flood (PMF). Hydraulic analysis indicates that outflow resulting from the PMF (AMC II) will overtop the dam by a maximum depth of 3.4' for a duration of 1.8 hours. Additional analysis indicates that outflow from the  $\frac{1}{2}$ PMF will overtop the dam by a maximum depth of .93' for 0.5 hours.
- Assuming that the rock debris was cleared away from the spillway side walls and that the crest of the spillway was graded level to elevation 701.0 over its entire length, the dam would overtop by 2.7' for 1.6 hours during the PMF. The  $\frac{1}{2}$ PMF would overtop the dam by 0.7' for 0.4 hours. (See Appendix F)
- 3.5 Conclusions and Recommendations
- 3.5.1 Conclusions - On the basis of visual evidence and engineering judgment, the dam is considered to be structurally stable. The embankment slopes are moderate and are considered adequate. No seepage problems appear to exist. The dam has the appearance that it is well constructed.

Hydraulic analysis indicates that the spillway will not pass the PMF as required by OCE guidelines for dams of intermediate size and high hazard potential.

The project is situated in Seismic Zone 1, indicating that risk of damage from seismic activity is only minor.

The dam is considered to have a condition classification of "significantly deficient" solely because the spillway will not pass the appropriate design flood. It does not pose a threat of imminent failure.

3.5.2 Recommendations

- a. Remove all trees and all other woody vegetation from the embankment.
- b. The services of a qualified engineer should be obtained for development of project modifications that will allow safe passage of the PMF.
- c. An emergency action plan should be developed, including a warning system to alert downstream residents, in the event a serious condition develops with the dam.

#### SECTION 4 REVIEW BOARD FINDINGS

The Interagency Review Board for the National Program of Inspection of Non-Federal Dams met in Nashville on 10 April 1981 to examine the technical data contained in the Phase I investigation report for Jennings Creek Watershed Dam No. 15. The Review Board considered the information and recommended that (1) the ownership of the dam be clarified and the owner be made aware of his responsibilities in relation to the operation and maintenance of the structure, (2) an emergency action plan be developed, including a warning system to alert downstream residents in the event that a serious condition develops with the project, (3) an inspection during normal pool conditions should be undertaken to observe any problems not apparent with a dry reservoir, and (4) the condition classification should be changed from "unsafe-nonemergency" to "significantly deficient." They agreed with other report conclusions and recommendations. A copy of the letter report presented by the Review Board is included in Appendix G.

**APPENDIX A**  
**DATA SUMMARY**

APPENDIX A  
DATA SUMMARY

A.1     Dam

A.1.1    Type - The dam is a linear earthen structure with an open channel emergency spillway excavated in rock at the left abutment. The principal spillway is a reinforced concrete riser with a steel cylinder pipe.

A.1.2    Dimensions and Elevations - Elevations are expressed in feet above mean sea level and are referenced to the emergency spillway crest, elevation 701.0, as given on the SCS design drawings.

- a. Crest length - 310'
- b. Crest width - 14'
- c. Height - 44.7' (low point in crest to downstream invert of principal spillway pipe)
- d. Crest elevation - 709.0
- e. Emergency spillway crest elevation - 701.0
- f. Principal spillway crest elevation - 684.5 (normal pool)
- g. Embankment slope, upstream - 2.6H:1V
- h. Embankment slope, downstream - 2.5H:1V

A.1.3    Embankment Zoning - None

A.1.4    Cut-off and Grout Curtains - A cut-off trench was excavated to bedrock (elevation 656) along the dam centerline. The design plans specify a 10' base width and 1:1 side slopes. A 4' wide by 8' tall embankment drain 230' in length is specified for the downstream slope. Its design location is 62' upstream of the principal spillway outlet. It is designed to consist of Olean sand and gravel surrounding an 8" diameter perforated corrugated metal pipe. No grouting was done on the foundation.



A.1.5 Instrumentation - None

A.1.6 Operation and Maintenance - Section 70-1801 through 70-1849 of the Tennessee Code Annotated (Watershed District Act of 1955) provides for the establishment of the Watershed Districts and the Watershed District Boards. Easement rights for the construction of the Jennings Creek Dams were obtained by the Board from the local property owners. The extent of ownership retained by the individuals is being negotiated, with the stipulation (Section 70-1847) that the Board has full operation and maintenance authority.

In the case of Jennings Creek, the entire Board has been liquidated through death or retirement. A written petition signed by 5% of the land owners in the watershed is required for it to be reestablished (by TCA Section 70-1822). A petition has been drafted and signed and is awaiting action from the court.

According to Perry Fuqua, SCS District Conservationist, Jackson County, the Watershed District is to make periodic inspections of the dams as needed and at least annually to determine any remedial measures needed.

A record of the inspections and maintenance operations is to be kept on file and will be available for use by representatives of the SCS. Specific maintenance agreements are to be executed prior to the construction of structural works of improvements.

A.2 Reservoir and Drainage Area

A.2.1 Reservoir

a. Normal Pool

1. Elevation - 684.5
2. Surface area - 5.7 acres
3. Storage - 31 acre-feet
4. Length of reservoir - 1100'

b. At Emergency Spillway Crest

1. Elevation - 701.0
2. Surface area - 10 acres
3. Storage - 161 acre-feet

c. At Maximum Pool

1. Elevation - 709.0
2. Surface area - 14 acres
3. Storage - 255 acre-feet

A.2.2 Drainage Area

- a. Size - 490 acres
- b. Soils - Bodine, Mountview, Delrose, Dickson, Mimosa
- c. Average slope - 40%
- d. Land use - Woods, pasture, few roads, and isolated structures
- e. Runoff from PMP (28.5" in 6 hours)
  1. AMC II - 24.5"
  2. AMC III - 26.8"
- f. Runoff from 100 year storm (4.8" in 6 hours)
  1. AMC II - 2.2"
  2. AMC III - 3.4"

A.3 Outlet Structures

A.3.1 Service Spillway and Drawdown

- a. Type - Single stage concrete riser and AWWA C-301 steel cylinder concrete pipe
- b. Size - Riser - 2' x 6' (inside diameter)  
Pipe - 15" diameter, 242' long

- c. Pipe gradient - 1.5%
- d. Drawdown - 16" opening covered by 24" slide gate

A.3.2 Emergency Spillway

- a. Type - Excavated in rock, right wall is fill material, left wall is natural bedrock.
- b. Size - 16' bottom width, 2.4H:1V (rt) and 1.6H:1V (lt) side slopes, 4.7' above spillway crest, later slope becomes vertical.
- c. Capacity - 1917 cfs at top of dam.

A.4 Historical Data

A.4.1 Construction Date - 1961

A.4.2 Designer - Soil Conservation Service

A.4.3 Builder - Ascon, Inc.

A.4.4 Owner - Jonah Sadler (See A.1.6 - Operation and Maintenance)

A.4.5 Previous Inspections - by SCS

A.4.6 Seismic Zone - 1

A.5 Downstream Hazard Data

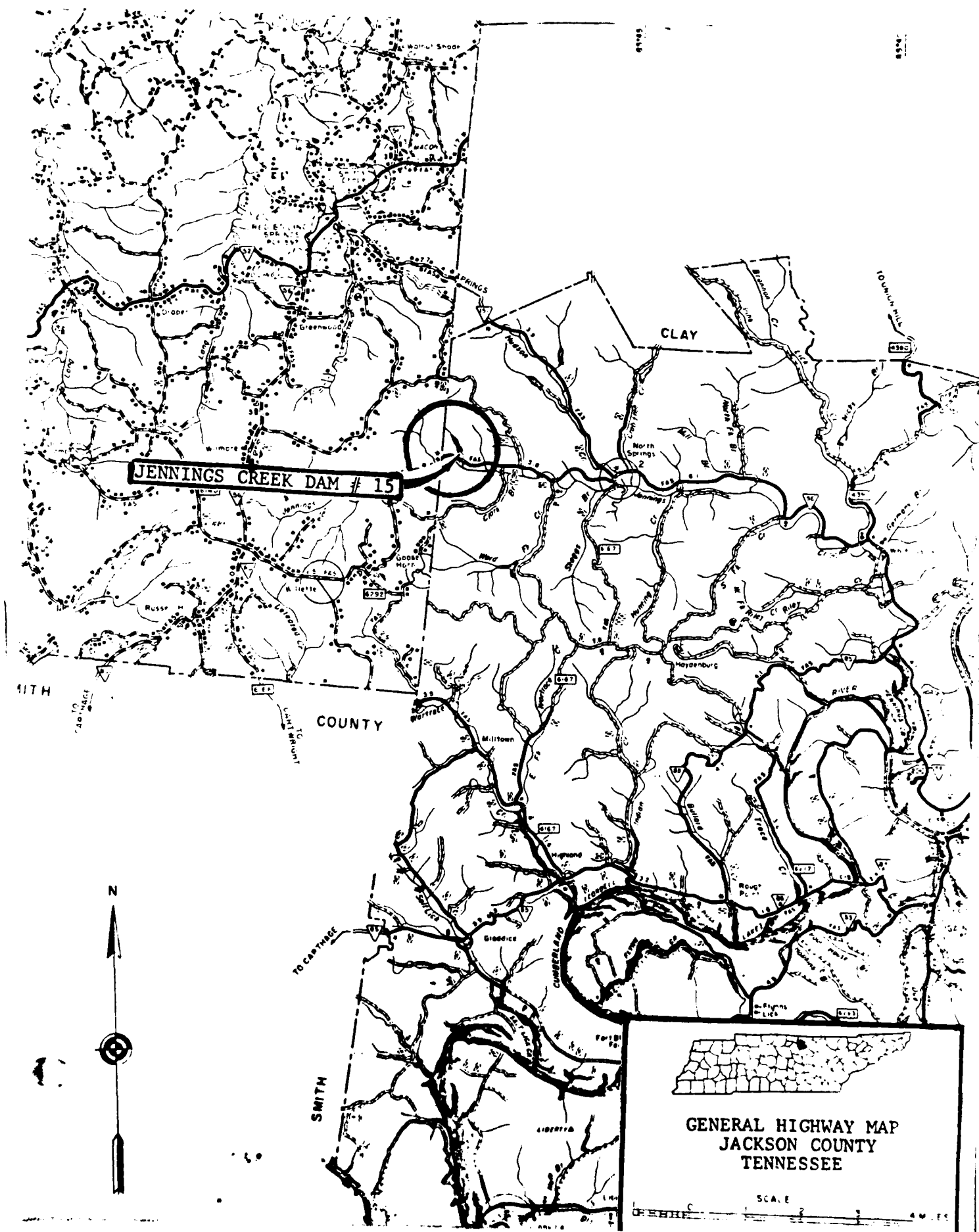
A.5.1 Downstream Hazard Potential Classification - High

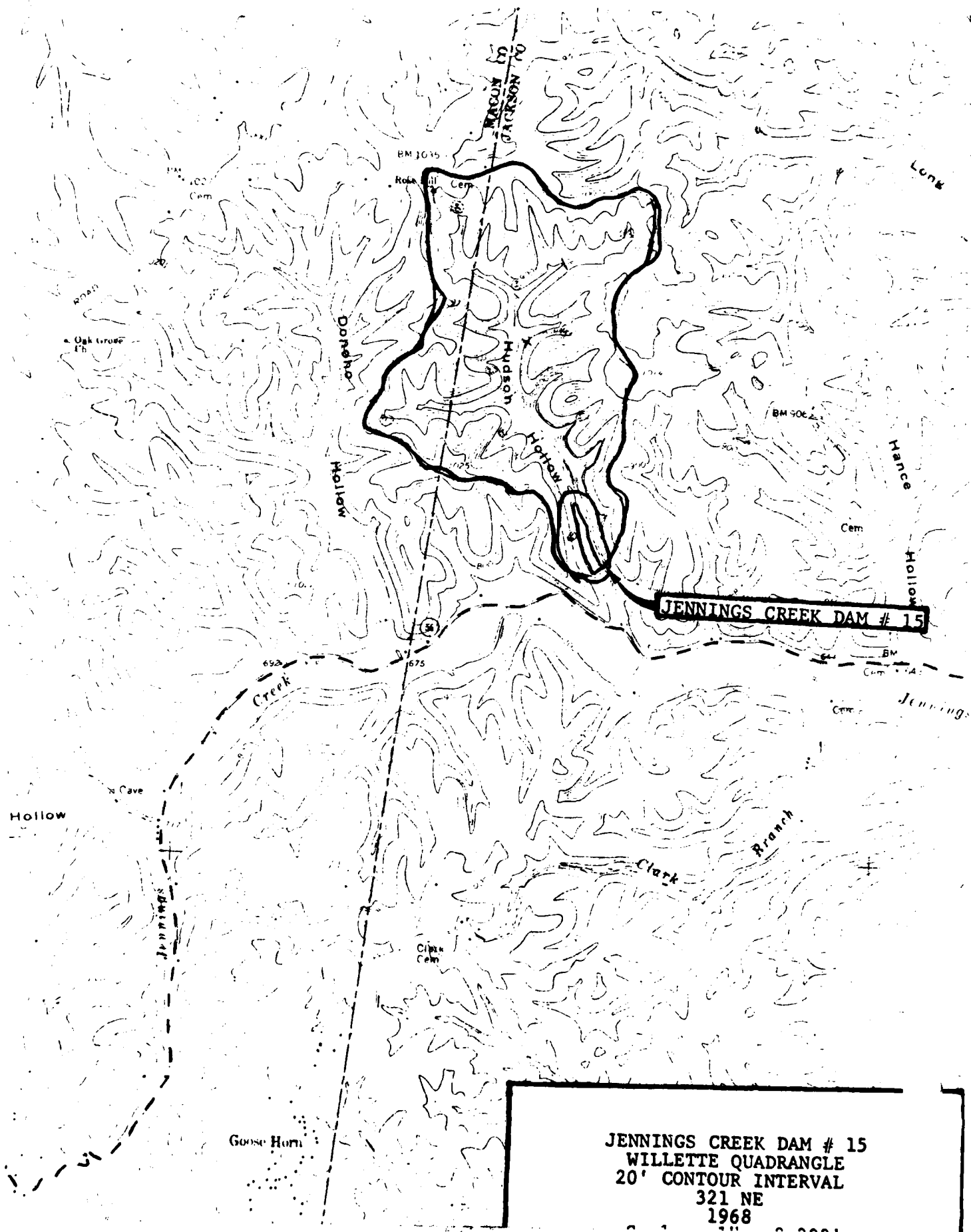
A.5.2 Persons in Likely Flood Path - Approximately 8

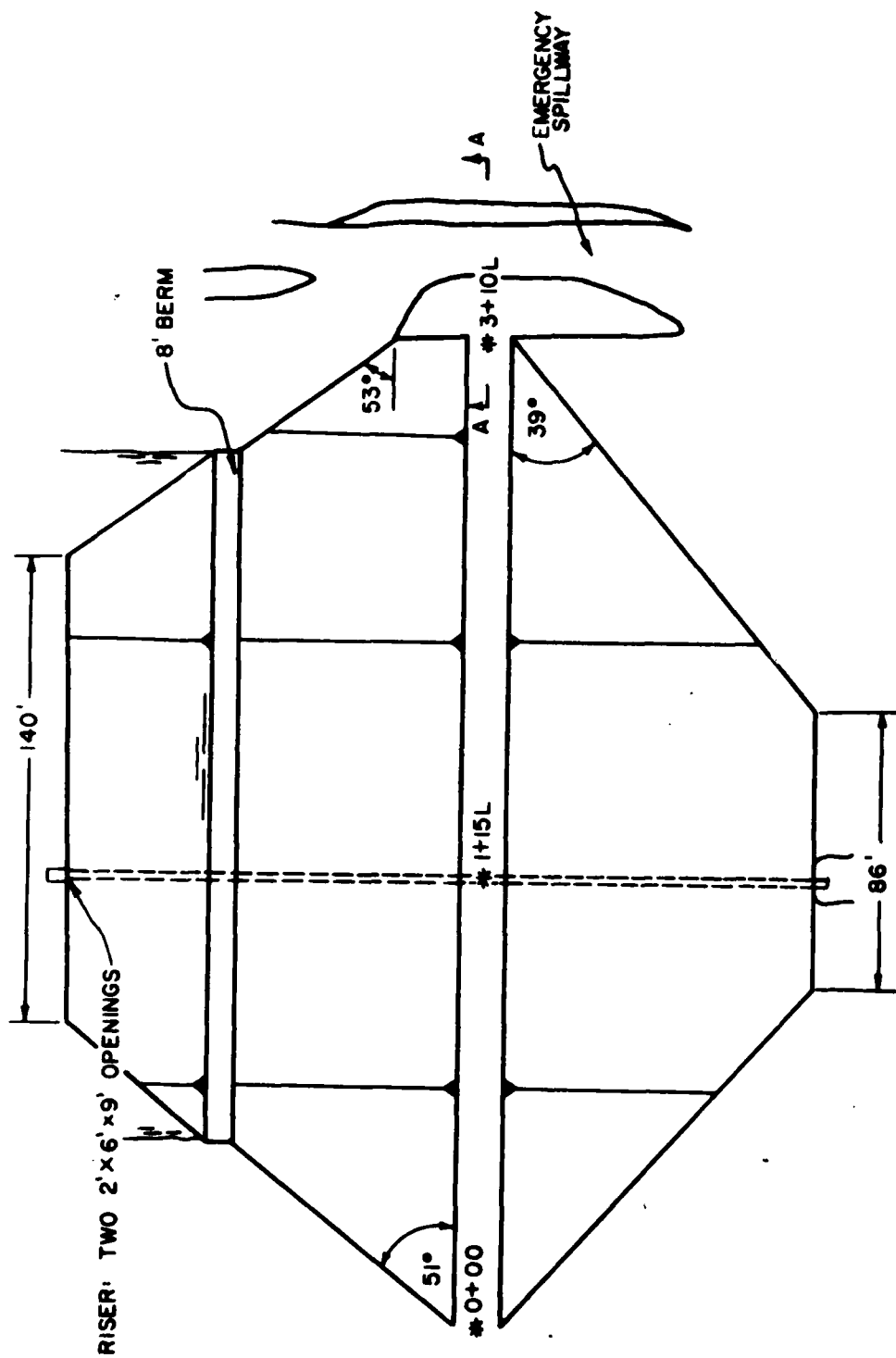
A.5.3 Downstream Property - 2 houses several hundred feet downstream, State Route 56 crosses the channel approximately 1,000 feet downstream of the dam.

A.5.4 Warning Systems - None

**APPENDIX B**  
**SKETCHES AND LOCATION MAPS**



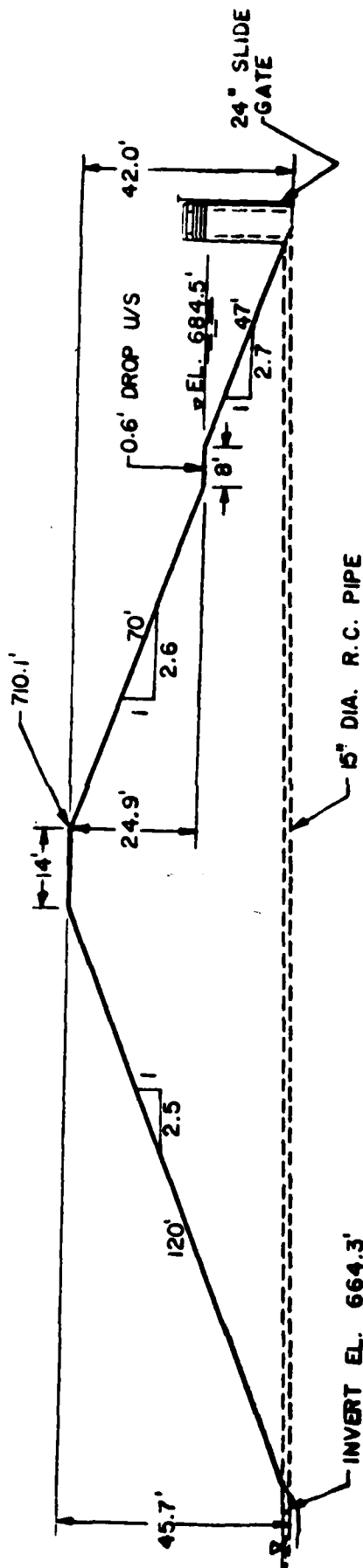




GENERAL PLAN  
N. T. S.

JENNINGS CREEK  
DAM NO.  
15

DRAWN BY: G. A. D.  
DATE: 3 DEC. 80  
SHEET: 1 OF 5



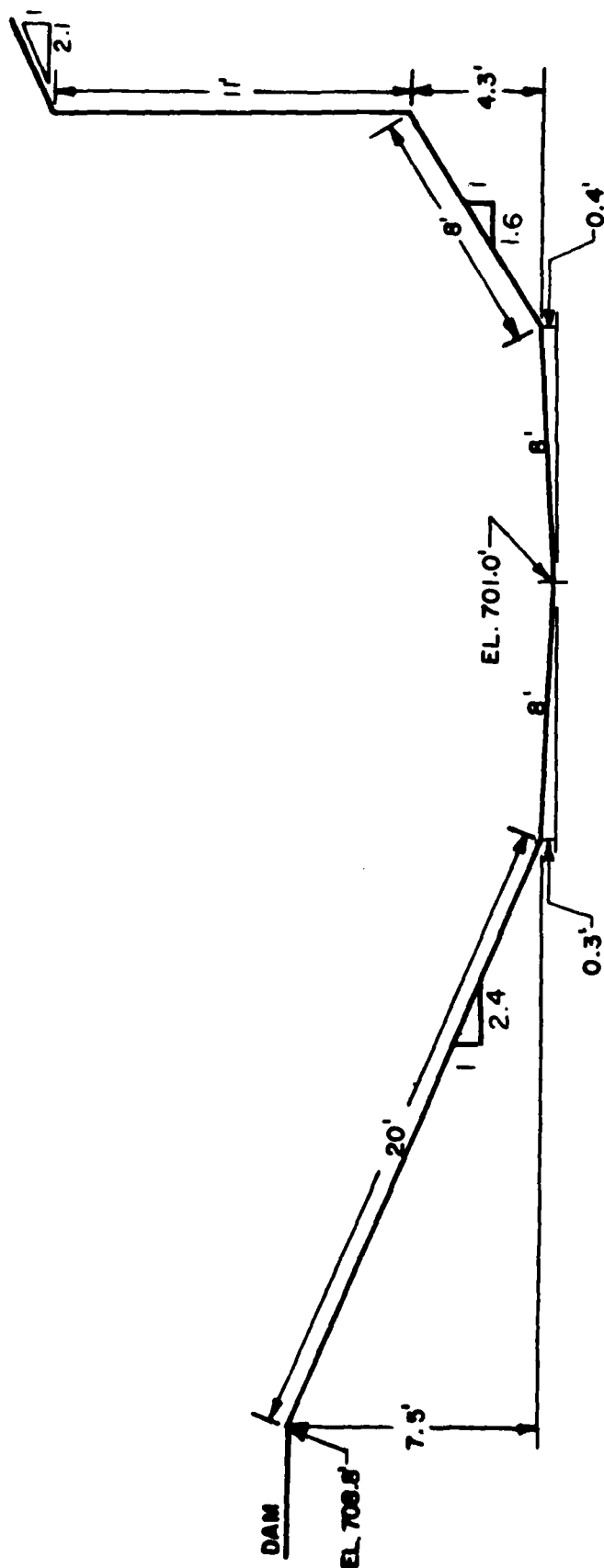
MAXIMUM SECTION  
SCALE: 1" = 30'

NOTE: ALL ELEVATIONS ARE  
REFERENCED TO EMER. SPIL.  
CREST ELEV. 701.0' MSL AS  
GIVEN ON SCS DESIGN DRAWINGS.

JENNINGS CREEK  
DAM NO. 15

DRAWN BY: M.J.F.  
DATE: 3 DEC. 80  
SHEET: 2 OF 5



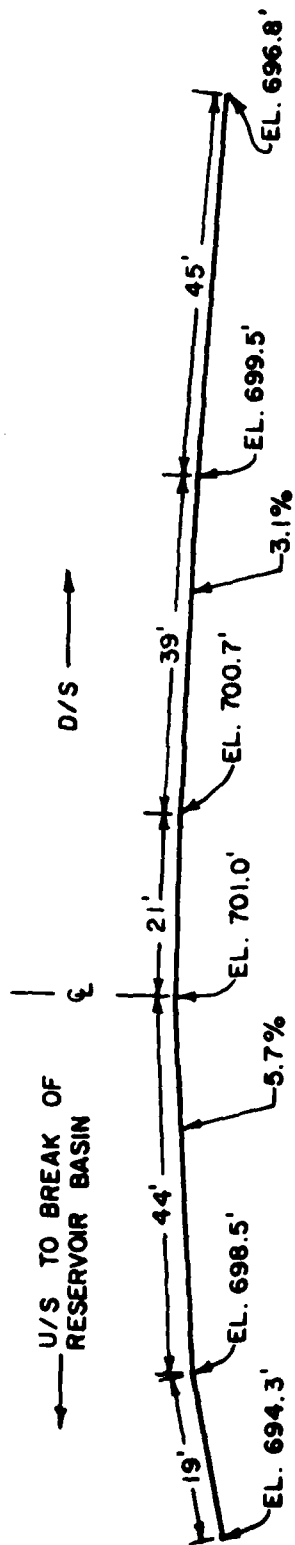


SECTION - A-A  
EMERGENCY SPILLWAY CROSS-SECTION

SCALE: 1" = 5'

JENNINGS CREEK  
DAM NO. 15

DRAWN BY: M.J.F.  
DATE: 3 DEC. 80  
SHEET: 3 OF 5



EMERGENCY SPILLWAY PROFILE

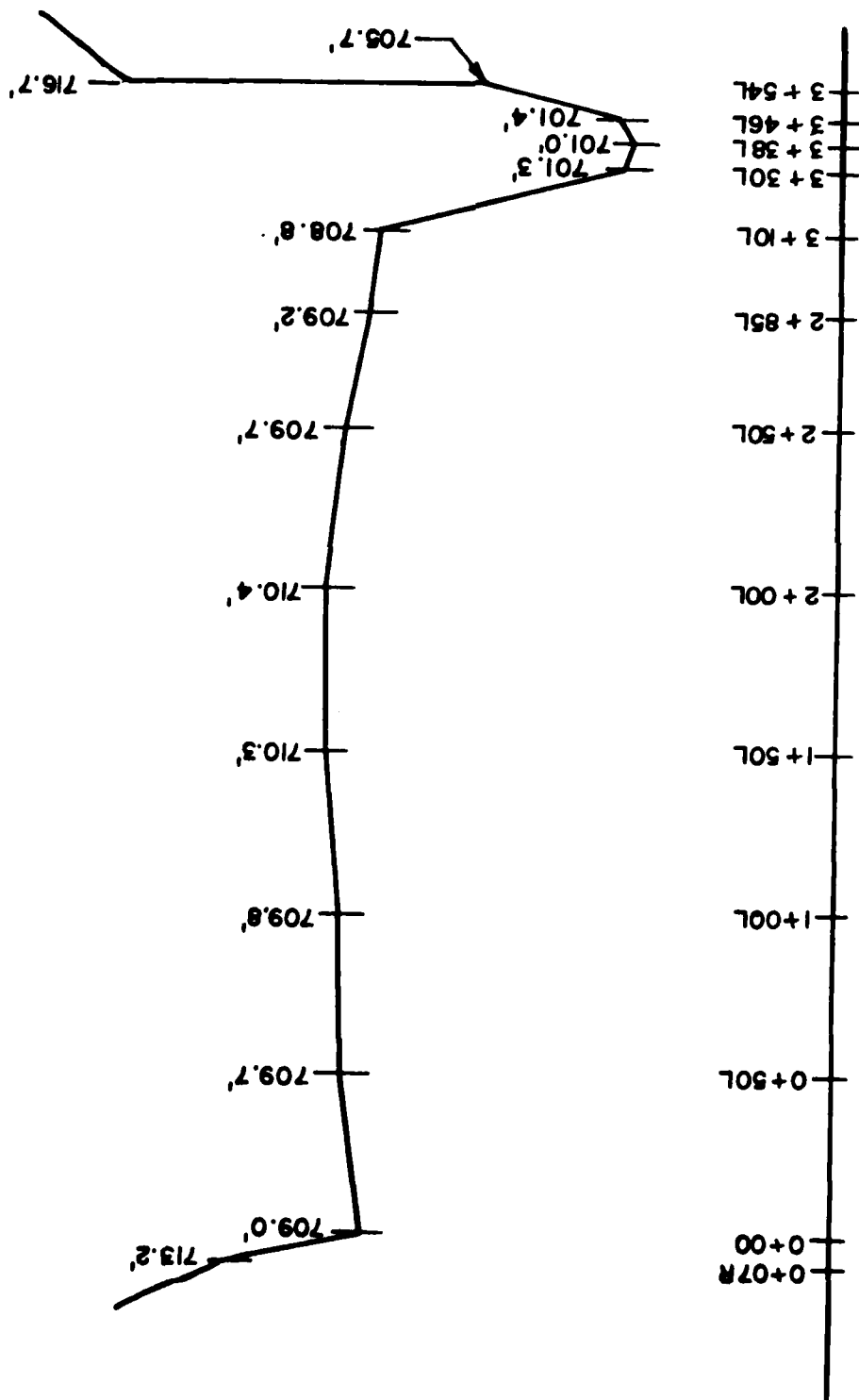
SCALE: 1" = 20'

JENNINGS CREEK  
DAM NO. 15

DRAWN BY: G.A.D.  
DATE: 3 DEC. 80  
SHEET: 4 OF 5

# JENNINGS CREEK DAM NO. 15

DRAWN BY: M.J.F.  
DATE: 3 DEC. 60  
SHEET: 5 OF 5



DAM PROFILE  
HORO. SCALE: 1"=50'  
VERT. SCALE: 1"=5'

**APPENDIX C**  
**PHOTOGRAPHIC RECORD**

PHOTOGRAPHIC RECORD  
JENNINGS CREEK WATERSHED DAM NO. 15

- Photo No. 1 - Crest and downstream slope of dam. Notice eroded gully at middle right of picture.
- Photo No. 2 - Area downstream of dam showing two houses.
- Photo No. 3 - Upstream slope and emergency spillway entrance channel from left side of spillway.
- Photo No. 4 - Lake floor showing tracks of earthmoving equipment from work performed on gate and entrance channel of emergency spillway.
- Photo No. 5 - Emergency spillway looking downstream from entrance channel.
- Photo No. 6 - Emergency spillway channel near critical section looking upstream. Notice loose rock debris.
- Photo No. 7 - Drawdown and gate valve.
- Photo No. 8 - Riser.
- Photo No. 9 - Groundwater seepage at upstream toe 10 feet left of riser. 1-2 gpm flow.
- Photo No. 10 - Eroded gully off emergency spillway exit channel. Notice principal spillway plunge pool in background.
- Photo No. 11 - Artesian well several feet downstream of embankment at right side.
- Photo No. 12 - Principal spillway outlet and plunge pool.
- Photo No. 13 - Monument showing plaque.

\*The photographs containing snow were taken during the inspection. All other pictures were made during the field survey of November 5, 1980.



PHOTO NO. 1



PHOTO NO. 2

2

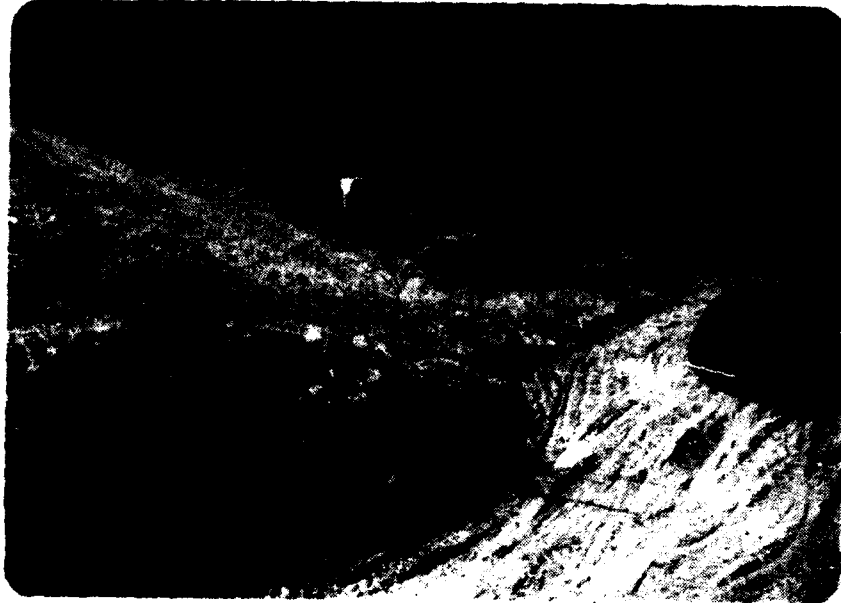


PHOTO NO. 3



PHOTO NO. 4

2



PHOTO NO. 5



PHOTO NO. 6





PHOTO NO. 7



PHOTO NO. 8



PHOTO NO. 9



PHOTO NO. 10



PHOTO NO. 11

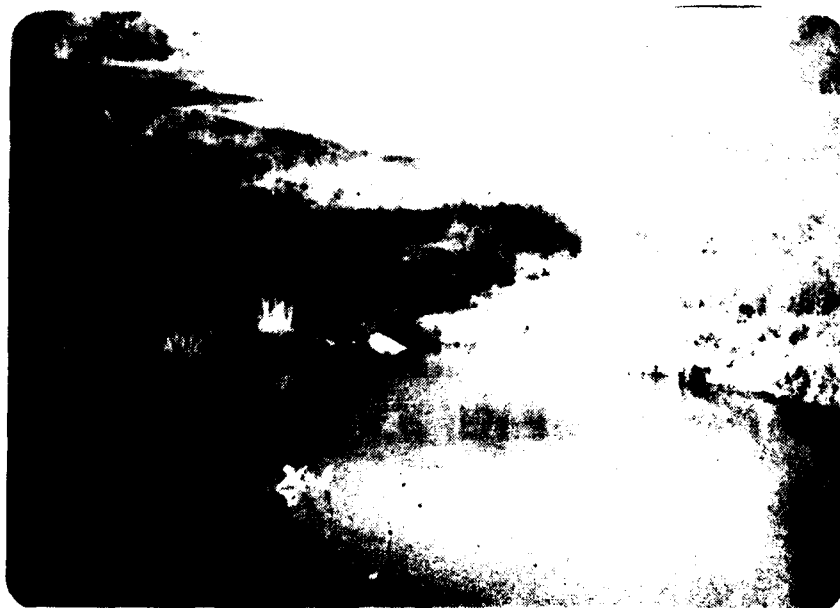
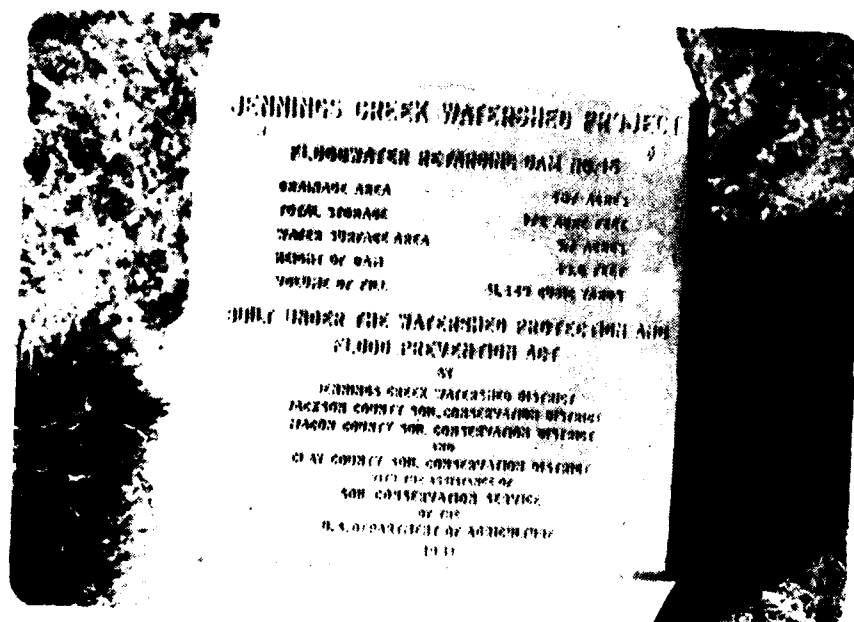


PHOTO NO. 12



JENNINGS CREEK WATERSHED PROJECT

FLOODWATER RETENTION DAM NO. 1

DRAINAGE AREA	104 ACRES
POOL STORAGE	100 ACRES
WATER SURFACE AREA	100 ACRES
HEIGHT OF DAM	100 FEET
LENGTH OF DAM	100 FEET

ONLY UNDER THE WATERSHED PROTECTION ACT  
FLOOD PREVENTION ACT

BY  
JENNINGS CREEK WATERSHED DISTRICT  
JACKSON COUNTY SOIL CONSERVATION DISTRICT  
JACKSON COUNTY SOIL CONSERVATION DISTRICT  
AND  
CLAY COUNTY SOIL CONSERVATION DISTRICT  
FOR THE PURPOSES OF  
SOIL CONSERVATION SERVICE  
OF THE  
U.S. DEPARTMENT OF AGRICULTURE  
1933

PHOTO NO. 13

APPENDIX D  
TECHNICAL CRITIQUE -  
CHECKLISTS FOR VISUAL INSPECTION,  
ENGINEERING DATA, SOIL TESTS

Check List  
Visual Inspection of Earth Dams  
Department of Conservation  
Division of Water Resources

Name of Dam Jennings Creek Watershed Dam # 15  
County Jackson Date of Inspection January 8, 1981  
ID # - State 44-7005 Federal TN 08705  
Type of Dam Earth  
Hazard Category-Federal High State 1  
Weather Partly cloudy, scatterd snow on gr. Temperature 25° F  
Pool at Time of Inspection Drained (distance from crest)  
Tailwater at Time of Inspection 0.1' (distance from stream bed)  
Design/As Built Drawings Available: Yes S No         
Location: SCS - Nashville office  
Copy Obtained: Yes X No         
Reviewed: Yes X No         
Construction History Available: Yes        No X  
Location:         
Copy Obtained: Yes        No         
Reviewed: Yes        No         
Other Records and Reports Available: Yes X No         
Location: SCS - Nashville  
Copy Obtained: Yes        No X  
Reviewed: Yes        No         
Prior Incidents or Failures: Yes        No X  
Inspection Personnel and Affiliation:  
Ed O'Neill - TDWR Al Dunn - Corps of Engineers  
Bob Ramsey - TDWR Perry Fugua - SCS  
William Culbert, Jr. - TDWR Jonah Saddler - Property owner

7. Embankment

A. Crest

Description (1st inspection) Flat and uniform.

No undesirable vegetation.

1. Longitudinal Alignment Straight

2. Longitudinal Surface Cracks None

3. Transverse Surface Cracks None

4. General Condition of Surface Good

5. Miscellaneous

B. Upstream Slope

1. Undesirable Growth or Debris Half dozen 1" diameter  
trees near riser. Dozens of seedlings scattered  
near face. More near mid-section.

2. Sloughing, Subsidence, or Depressions Nothing  
significant.

3. Slope Protection Well grassed with fescue. Wave berm  
at normal pool.

a. Condition of Riprap N/A

b. Durability of Individual Stones N/A

c. Adequacy of Slope Protection Against Waves  
and Runoff Adequate

d. Gradation of Slope Protection - Localized Areas  
of Fine Material N/A

4. Surface Cracks None

5. Miscellaneous - Minor spring seepage from ground water  
at upstream toe 8' left of riser.

C. Downstream Slope

1. Undesirable Growth or Debris Some 2" heavenwood at  
right toe and along right tie-in. Some seedlings



2. Sloughing, Subsidence, or Depressions; Abnormal

Bulges or Non-Uniformity None

3. Surface Cracks on Face of Slope

None

4. Surface Cracks or Evidence of Heaving at

Embankment Toe None

5. Wet or Saturated Areas or Other Evidence of Seepage  
on Face of Slope; Evidence of "Piping" or "Boils"

None

6. Drainage System None observed. Toe drain outlets  
are probably submerged in stilling basin.

7. Fill Contact with Outlet Structure Good

8. Condition of Grass Slope Protection Good

**D. Abutments**

1. Erosion of Contact of Embankment with Abutment from  
Surface Water Runoff, Upstream or Downstream \_\_\_\_\_  
Nothing significant  
\_\_\_\_\_
2. Springs or Indications of Seepage Along Contact of  
Embankment with the Abutments \_\_\_\_\_  
None  
\_\_\_\_\_
3. Springs or Indications of Seepage in Areas a Short  
Distance Downstream of Embankment - Abutment Tie-in  
Capped artesian well approximately 20' downstream  
of dam at right abutment.  
\_\_\_\_\_

II. Area Downstream of Embankment, Including Channel

A. Localized Subsidence, Depressions, Sinkholes, Etc. \_\_\_\_\_

None

B. Evidence of "Piping", "Boils", or "Seepage" \_\_\_\_\_

None

C. Unusual Presence of Lush Growth, such as Swamp  
Grass, etc. \_\_\_\_\_

None

D. Unusual Muddy Water in Downstream Channel \_\_\_\_\_

None

E. Sloughing or Erosion Insignificant amount

F. Surface Cracks or Evidence of Heaving Beyond  
Embankment Toe None

G. Stability of Channel Sideslopes Stable. Only minor  
erosion.

H. Condition of Channel Slope Protection Good condition  
Natural cover.

I. Adequacy of Slope Protection Against Waves, Currents,  
and Surface Runoff Adequate

J. Miscellaneous

K. Condition of Relief Wells, Drains, and Other  
Appurtenances N/A

L. Unusual Increase or Decrease in Discharge from  
Relief Wells N/A

## II. Instrumentation

A. Monumentation/Surveys Information plaque near down-  
stream toe.

B. Observation Wells N/A

C. Weirs N/A

D. Piezometers N/A

E. Other \_\_\_\_\_

#### IV. Spillways

##### A. Service Spillway (Service/Emergency Combination Yes \_\_\_ No X)

1. Intake Structure Condition Good. No crackings  
or significant weathering.
2. Outlet Structure Condition No structure except  
submerged support.
3. Pipe Condition Most of pipe outlet is submerged.  
That part visible appears in good condition.
4. Evidence of Leakage or Piping None
5. General Remarks Water level in plunge pool is such  
that pipe remains 3/4 submerged.

##### B. Emergency Spillway

1. General Condition Good. Uniform and well defined.  
Some loose rock along left side of base. Considered  
in hydraulic calculations.
2. Entrance Channel Good. Clear and well defined.  
Debris from earth slide was cleared in summer of  
1980.
3. Control Section Same as general condition.

3. Exit Channel Good. Clear and well defined.
4. Vegetative/Woody Cover A few small heavenwood trees  
on right side wall near critical section.
5. Other Observations Rockfill wingwall bounds  
right side of spillway channel approximately 5' wide  
by 4' deep was eroded at outlet of emergency spill-  
way during flood of 1969 (see photo).

V. Emergency Drawdown Facilities (if part of service spillway  
so state) 15" drawdown covered by 24"x24" manually operated  
sliding head gate installed summer of 1980

Are Facilities Operable: Yes X No       

Were Facilities Operated During Inspection: Yes        No X

Date Facilities Were Last Used Summer of 1980



VI. Reservoir

A. Slopes 45% average basin slopes

B. Sedimentation Low. Basin is revegetated.

C. Turbidity N/A. Lake was drained

VII. Drainage Area

Description (for hydrologic analysis)

Predominantly wooded mountaineous area.

A. Changes in Land Use None expected. Rural area with  
little industry.

VIII. Downstream Area (Stream)

A. Condition (obstructions, debris, etc.) \_\_\_\_\_

State Highway bridge several hundred feet downstream. No other significant obstructions.

B. Slopes \_\_\_\_\_ 1% channel \_\_\_\_\_

C. Approximate No. Homes, Population, and Distance D/S \_\_\_\_\_

2 houses, 460 and 1,000 feet downstream

D. Other Hazards \_\_\_\_\_

Interview data obtained during inspection:

Interview with owner:

Jonah Saddler  
Route # 1, Red Boiling Springs, Tenn. 37150  
Tel: 621-3361

- 1) Lives in mobile home immediately downstream of dam.
- 2) Drawdown valve is kept open always at his request due to fear of overtopping and because of problems with vagrants and vandals.
- 3) The emergency spillway has carried flow 3 times, once with the lake drained prior to the storm, twice with the lake at Normal Pool. Two of the floods occurred June 1969, and 1974.
- 4) He was present during 1946 flood when several lives were lost.
- 5) Under a 9" rainfall 4' depth was developed in the emergency spillway.
- 6) 16' deep artesian well just downstream of right abutment toe.
- 7) No foundation grouting was done.

According to Perry Fuqua (District Conservationist of Jackson County) the entire watershed board has retired or is deceased. Replacement procedures are difficult.

**IX. Miscellaneous**

**Incidents/Failures** 3 times water has come over emergency spillway.

**Observed Geology of Area** Rock outcropping of spillway is apparently Fort Payne formation.

**X. Conclusions**

The dam appears to be well constructed and in good condition.

**XI. Recommendations**

- 1) Keep the embankment clear of all woody vegetation.
- 2) Clear loose rock from left side of spillway base.
- 3) Reservoir should not be allowed to revert to a forested area. This could be achieved by maintaining the lake at Normal Pool elevation for one growing season.
- 4) The watershed district board should be reestablished and the inspection and maintenance schedule should be continued.

W. H. H. Gilbert Jr.  
Regional Engineer

Ed. J. Hall  
Chief Engineer

# OHIO RIVER DIVISION, NASHVILLE DISTRICT SOIL TEST DATA SUMMARY

PROJECT Jennings No. 15 HOLE \_\_\_\_\_ ELEV. TOP \_\_\_\_\_ SHEET 1 OF 1 SHEETS

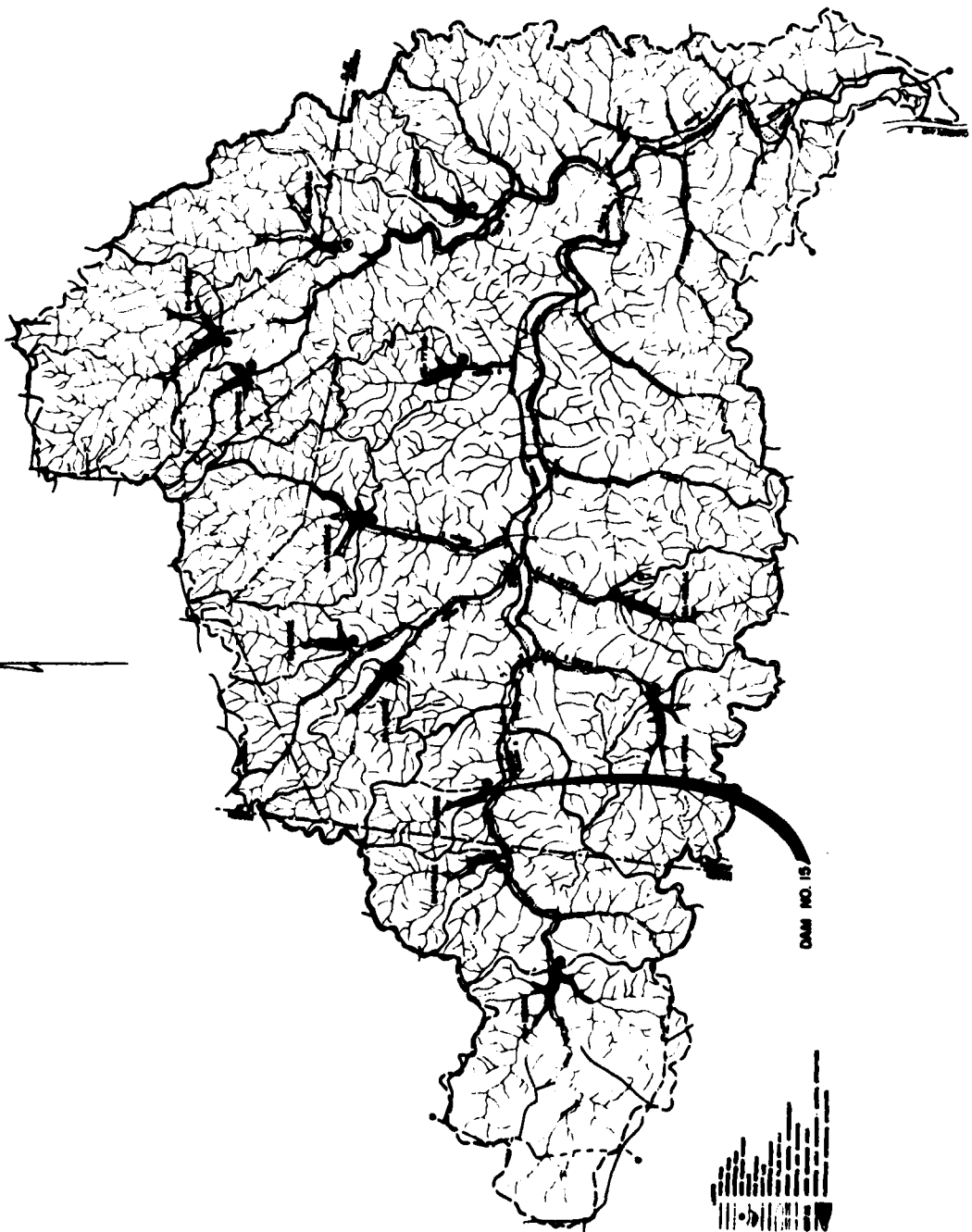
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**APPENDIX E**  
**DESIGN DRAWINGS**



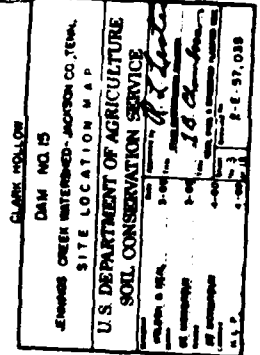
LETTER OF APPROVAL  
 S/ R. L. LESTER  
 MAY 6, 1960

CLAY HOLLOW	
DAM NO. 15	
JACKSON CREEK WATERSHED - JACKSON CO., TENN.	
LOCATION MAP	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
PROJECT NO.	15-1
PROJECT NAME	CLAY HOLLOW
PROJECT LOCATION	JACKSON CO., TENN.
PROJECT STATUS	PLANNED
PROJECT COST	\$ 0.00
PROJECT DATE	5-6-60
PROJECT NO.	15-1
PROJECT NAME	CLAY HOLLOW
PROJECT LOCATION	JACKSON CO., TENN.
PROJECT STATUS	PLANNED
PROJECT COST	\$ 0.00
PROJECT DATE	5-6-60





~~FROM COPY FURNISHED TO DDC~~

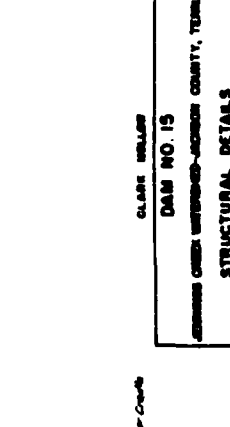
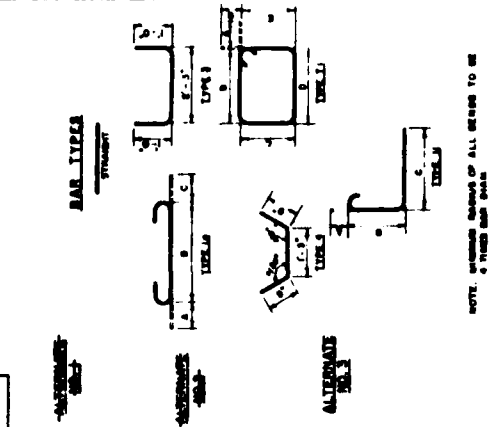
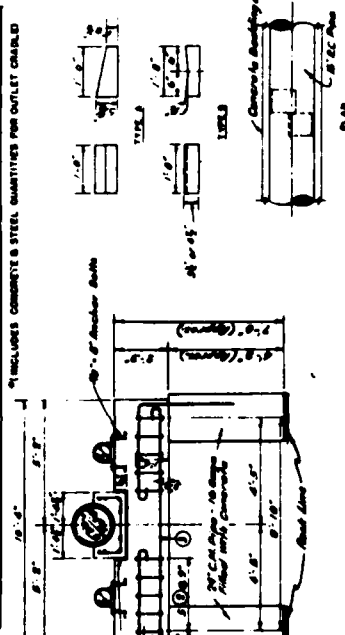
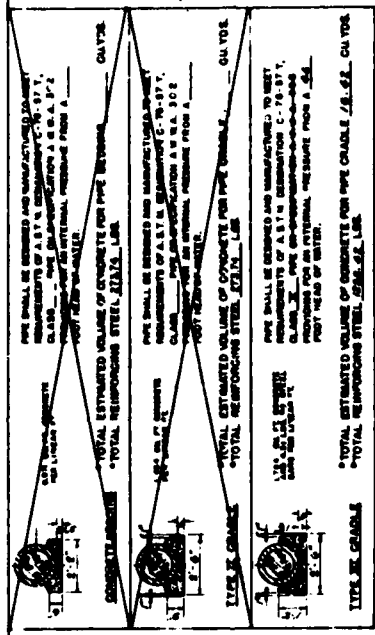
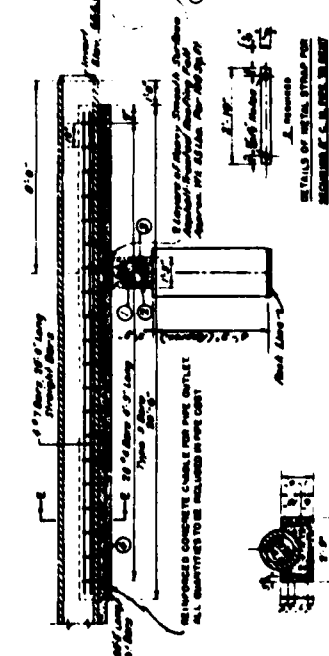
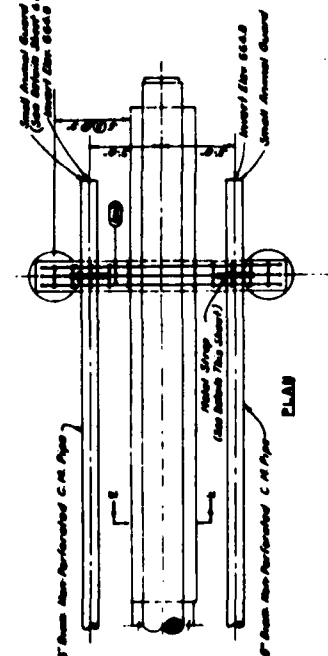
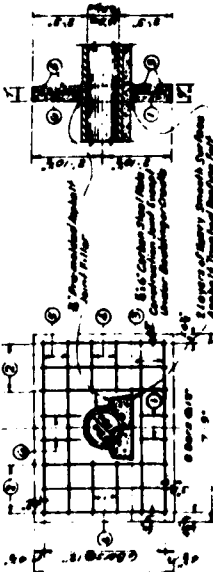


Form 800-371, December 1989





STEEL SCHEDULE FOR GIRT										
LOCAL TRIM	WELLS	QUANT	UNIT	TYPE	A	B	C	D	E	TOTAL FEET
Beam 1	4-1	4	LF	1	1	1	1	1	1	5
Beam 2	4-2	4	LF	1	1	1	1	1	1	5
Beam 3	4-3	4	LF	1	1	1	1	1	1	5
Beam 4	4-4	4	LF	1	1	1	1	1	1	5
Beam 5	4-5	4	LF	1	1	1	1	1	1	5
Beam 6	4-6	4	LF	1	1	1	1	1	1	5
Beam 7	4-7	4	LF	1	1	1	1	1	1	5
Beam 8	4-8	4	LF	1	1	1	1	1	1	5
Beam 9	4-9	4	LF	1	1	1	1	1	1	5
Beam 10	4-10	4	LF	1	1	1	1	1	1	5
Beam 11	4-11	4	LF	1	1	1	1	1	1	5
Beam 12	4-12	4	LF	1	1	1	1	1	1	5
Beam 13	4-13	4	LF	1	1	1	1	1	1	5
Beam 14	4-14	4	LF	1	1	1	1	1	1	5
Beam 15	4-15	4	LF	1	1	1	1	1	1	5
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Beam 98	4-98	4	LF	1	1	1	1	1	1	5
Beam 99	4-99	4	LF	1	1	1	1	1	1	5
Beam 100	4-100	4	LF	1	1	1	1	1	1	5

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U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

2000 1000 500 0

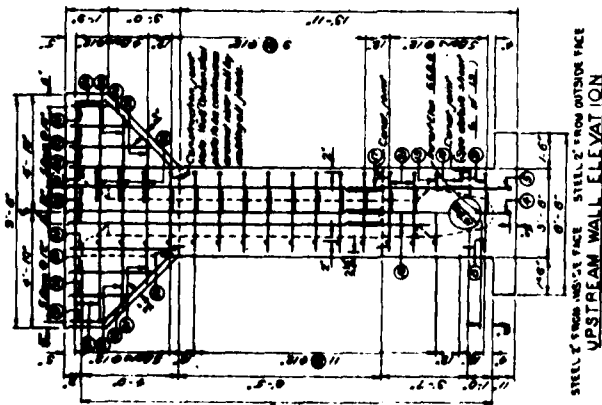
**DETAILS OF BENT AND PIPE OUTLET FOR ALL PIPE SECTIONS LESS THAN 16" - 0"**

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~~FROM 0001-0000 TO 0000~~

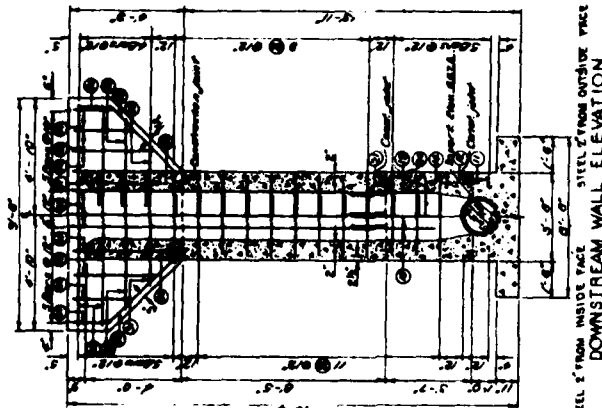


STEEL SCHEDULE																			
LOCATION	BAR	SIZE	SHAPE	LENGTH	TYPE	A	B	C	TOTAL FEET	LOCATION	MARK	SIZE	SHAPE	LENGTH	TYPE	A	B	C	TOTAL FEET
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
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23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
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26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
29	29	29	29																

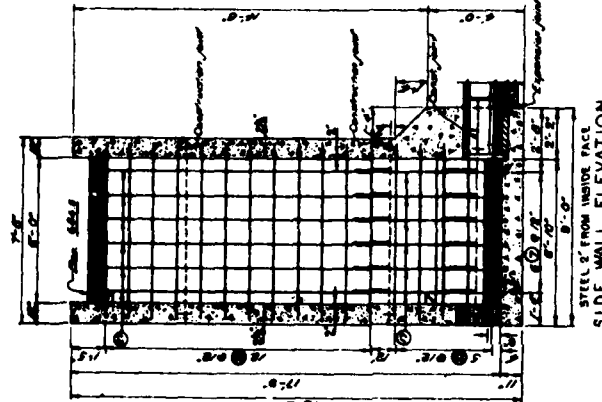
Quantity  
 Reinforcing Steel 1083.50 Lin Ft @ 23.16 Lbs  
 Reinforcing Steel 20425 Lin Ft @ 21.720 Lbs  
 Volume of Concrete 14.8 Cu Yds.  
 32.6' Ordent Street Pave 54.9 Cu Yds



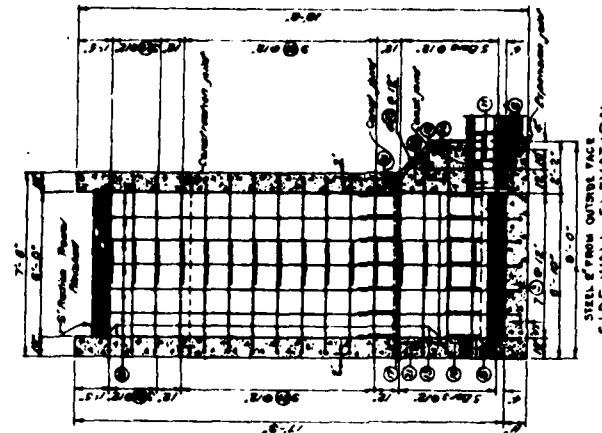
STEEL 2' FROM INSIDE FACE STEEL 2' FROM OUTSIDE FACE  
UPSTREAM WALL ELEVATION



STEEL 2' FROM INSIDE FACE      STEEL 2' FROM OUTSIDE FACE  
DOWNSTREAM WALL ELEVATION



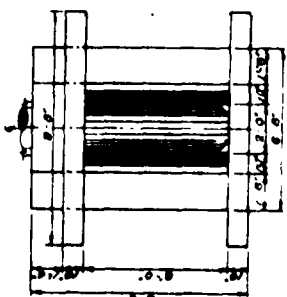
STEEL 2' FROM INSIDE FACE  
SIDE WALL ELEVATION



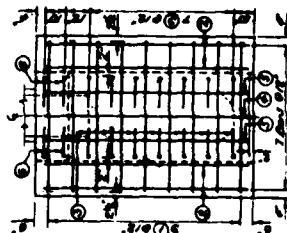
0'-0" STEEL 2" FROM OUTSIDE FACE

Note: Structure is symmetrical/ about C-  
Chamber all exposures appears the  
All fillets are 6".

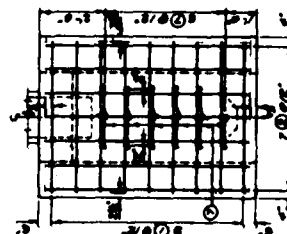
Note: Curved portion of river floor to be formed with Sonaraid fiber form (a spec)



PLAN .



5' FROM BOTTOM OF FLOOR  
BI AN



STEEL 2' FROM TOP OF FLOOR

[illegible]

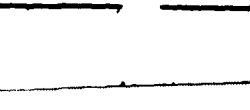
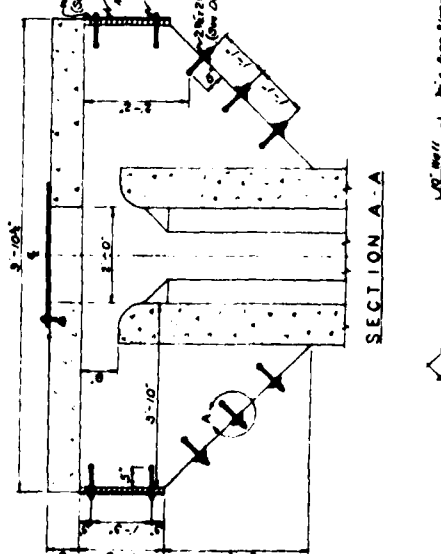
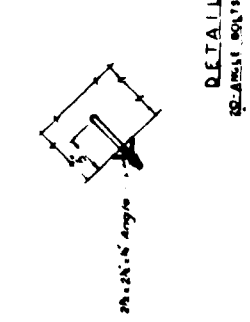
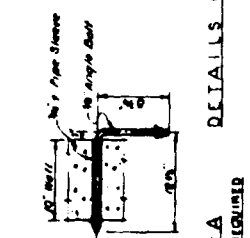
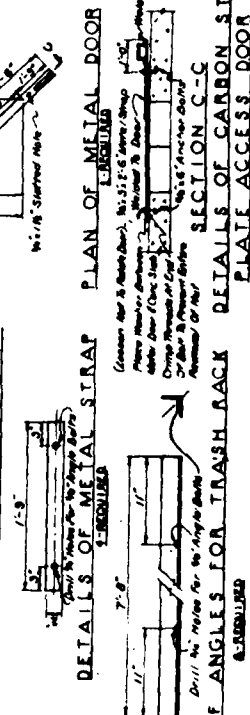
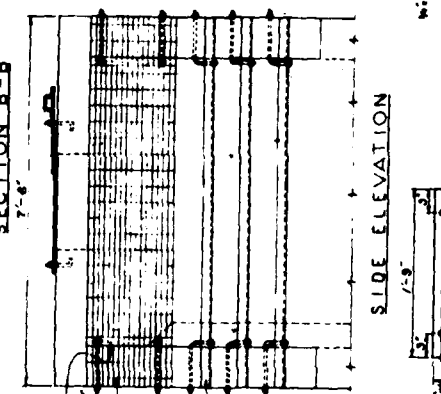
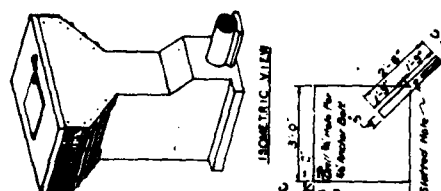
NO.	LOCATION	DATE	SIZE	QAMG	CLIMATE	TYPE	TOTAL
1	NO. 1	1900	4	12	5-0	37	116-0
2	NO. 2	1900	4	6	3-4	37	20-0
3	NO. 3	1900	4	10	7-3	37	110-0
4	NO. 4	1900	4	8	7-0	37	20-0

[illegible]

BAR TYPE	37901547
----------	----------

NOTE STEEL GRATING SMALL COMPARED TO REINFORCING SPECIFICATIONS, BRG-6016 NOTED AND TAKEN

### DETAILS OF GRATING



**DETAILS OF 16" DIAM SLIDE GATE**

CLARE HOLLOW	DAM NO. 15	JENNINGS CREEK WATERSHED - JACKSON COUNTY, TENN.
		DETAILS OF ANTI-VORTEX BAFFLE, TRASH RACK & HEADGATE
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		
No.	<i>P.L. 10-10</i>	
E.A. PROJECT	4-68	
S.D. DISTRICT	4-68	
C.D. DIVISION	10-10	
S.D. CLARK		
S.D. DIST.		2-E 97,000

**on Monday, 10/10/2012**



# JENNINGS CREEK WATERSHED PROJECT

## FLOODWATER RETARDING DAM NO. 15

DRAINAGE AREA	487 ACRES
TOTAL STORAGE	172 ACRE FEET
WATER SURFACE AREA	5.7 ACRES
HEIGHT OF DAM	43.0 FEET
VOLUME OF FILL	41,449 CUBIC YARDS

## BUILT UNDER THE WATERSHED PROTECTION AND FLOOD PREVENTION ACT

by  
JENNINGS CREEK WATERSHED DISTRICT  
JACKSON COUNTY SOIL CONSERVATION DISTRICT  
MACON COUNTY SOIL CONSERVATION DISTRICT  
and  
CLAY COUNTY SOIL CONSERVATION DISTRICT  
with the assistance of  
SOIL CONSERVATION SERVICE  
of the  
U.S. DEPARTMENT OF AGRICULTURE  
1961

## BRONZE PLAQUE

24" x 24"

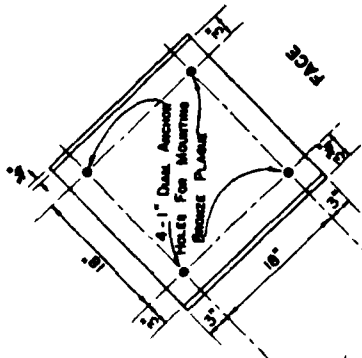


DETAILS OF FACE FASTENING

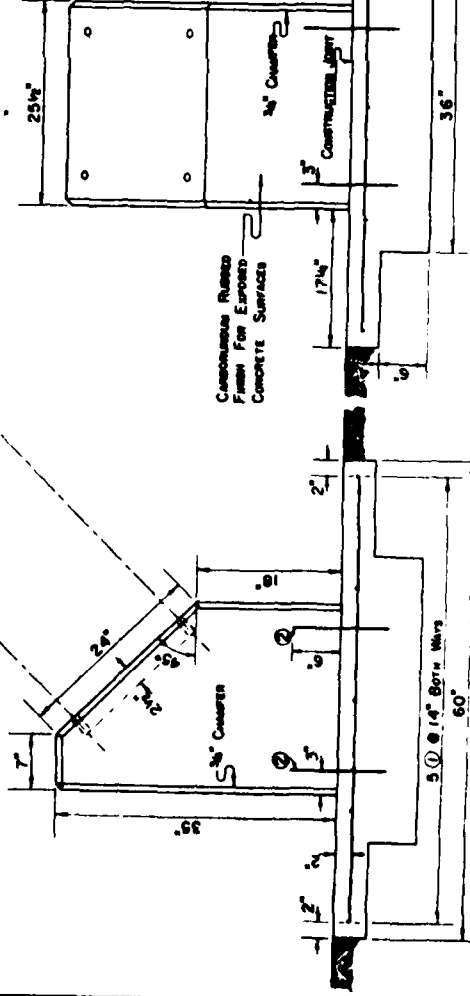
CLARK HOLLOW

DAM NO. 15	
JENNINGS CREEK WATERSHED-JACKSON CO. TEX.	
STRUCTURE MONUMENT	
U.S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
W.D. 100	9.00
OF AGRICULTURE	9.00
OF AGRICULTURE	9.00

BAS. NO.	QTY.	LENGTH	TOTAL LENGTH	SIZE	TYPE
1	10	4'-10"	48'-0"	3	STR.
2	4	1'-0"	4'-0"	4	STR.
Total Size No. 3 Steel = 48'-0" = 18.17 Lm.					
Total Size No. 4 Steel = 4'-0" = 2.67 Lm.					
Total Class "B" Concrete = 0.84 Cu. Yds.					



PLAN



FRONT ELEVATION

## CONCRETE MONUMENT

LEFT ELEVATION

NOTE  
Location Of Concrete Monument  
On The Site Will Be Made By  
The Project Engineer

APPENDIX F  
HYDRAULIC AND HYDROLOGIC DATA



## HYDROLOGIC AND HYDRAULIC ANALYSIS

According to OCE guidelines, Jennings Creek Watershed Dam No. 15 must be able to safely pass the Probable Maximum Flood (PMF) of 28.5" of rain falling in 6 hours. Six-hour rainfall depths for the Probable Maximum Precipitation (PMP) and the 100-year rainfall were obtained from the U. S. Weather Service's Technical Paper 40. Flood routings were performed using the HEC-1-DB computer program. The program used the dimensionless hydrograph technique described in Section 4 of the Soil Conservation Service National Engineering Handbook and the Modified Puls method of reservoir routing.

The peak outflow from the PMF is 7719 cfs which overtops the dam for 1.8 hours at a maximum depth of 2.8 feet. Program modification for an uneven crest and cleared spillway indicates that the dam will overtop 3.4 feet for the same duration.

# SUMMARY OF ROUTINGS

EVENT	ANTECEDENT MOISTURE CONDITION	
	II	III
PMF	Overtopped for 1.8 hrs. 2.8 feet maximum depth over dam	Overtopped for 2.2 hrs. 3.2 feet maximum depth over dam
$\frac{1}{2}$ PMF	Overtopped for 0.5 hrs. 0.81 feet maximum depth over dam	Overtopped for 0.5 hrs. 1.2 feet maximum depth over dam
100 - YEAR	Passed. 13.7 feet of freeboard	Passes. 7.6 feet of freeboard.

\*Additional spillway capacity required to pass PMF

5802 cfs (AMC II )  
7189 cfs (AMC III)

### SUMMARY OF ROUTINGS

Modification for Uneven Dam Crest and Cleared Spillway

EVENT	ANTECEDENT MOISTURE CONDITION	
	II	III
PMF	Overtops for 1.8 hours 3.4' maximum depth over dam.	Overtops for 1.9 hours. 3.87' maximum depth over dam.
$\frac{1}{2}$ PMF	Overtops for 0.50 hours 0.93' maximum depth over dam.	Overtops for 0.5 hours 1.57' maximum depth over dam.
100 - YEAR	Does not overtop. 13.4' of freeboard maintained.	Does not overtop. 7.45' of freeboard maintained.

## Jennings Creek Watershed Dam #15 - Data Sheet

### Basin Characteristics:

A. Watershed Size	490 acres (0.766 mi <sup>2</sup> )
B. Average Channel Slope	2%
C. Average Land Slope	40%
D. Hydrologic Soil Group	90% C (Dickson, Mimosa)
E. Time of Concentration	0.43 hours AMC II 0.32 hours AMC III
F. SCS Curve Number	73 AMC II 87 AMC III

### Reservoir Characteristics:

A. Normal Pool Elevation	684.5' msl
B. Dam Crest Elevation	709.0' msl
C. Normal Pool Area	5.7 acres
D. Normal Pool Length	1100'
E. Normal Pool Storage	31 acre-feet
F. Surcharge Storage Volume (Normal pool to dam crest)	224 acre-feet
G. Surface Area at Dam Crest	14 acres

### Emergency Spillway:

A. Type	Saddle, rock with 16' base width
B. Crest Elevation	701.0' msl
C. Maximum Discharge at Dam Crest	2019 cfs

# JOHN W. CREEK WATERSHED DAM #15

## CURVE NUMBER DETERMINATION:

LAND USE	% D.A.	CN FOR HYDROLOGIC SOIL GP.	
		B	C
FOREST	90	60	77
GRASS	5	69	79
BARREN	4	75	84
WATER	1		
		100	

## SOIL TYPES

	HYDROLOGIC SOIL TYPE	% D.A.
BUDING ME VIEW DEERSC	B	7
PICKSON MIMOSA	C	93

$$COMPOSITE CN = 0.90 [60(0.07) + 77(0.93)] + 0.05 [69(0.07) + 79(0.93)] + 0.04 [75(0.07) + 84(0.93)] + 0.01(100)$$

$$CN = 75 \text{ AMC II}$$

$$= 87 \text{ AMC III (CONVERSION FACTOR 1.16)} \quad (CONVERSION FACTOR 1.16)$$

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# JENNINGS CREEK WATERSHED DAM #15

## LAG TIME DETERMINATION

①  
SCS METHOD:  $T_c = \left( \frac{11.93 L^1}{H} \right)^{0.385}$

$T_c$  = TIME OF CONCENTRATION (HRS.)

$L$  = LENGTH OF REACH (MILES)

$H$  = DELEV. OF REACH (FT)

$S$  = AVER. SLOPE OF D. A. (%)

### WATER COURSE #

	1	2	3
$L$	0.379	0.189	0.758
$H$	200	40	75
$T_c$	0.110	0.092	0.358

$$T_c = 0.110 + 0.092 + 0.358$$

$$= \underline{\underline{0.552 \text{ hrs.}}}$$

② CURVE NUMBER METHOD:  $S = 40\%$

$$L = 2000'$$

$$CN = 73 \text{ (AMC II)}, 87 \text{ (AMC III)}$$

FROM NO. 100 CASH. 11-14

$$\text{FIG. 15.3 LAG} = \underline{\underline{25 \text{ HRS.}}}$$

$$= \underline{\underline{0.19 \text{ HRS.}}}$$

### TEXAS A&M UNIV. DEPT. NATIONAL METHOD:

	LENGTH OF REACH (ft)	AVER. SLOPE (%)	VEL. (ft/s)	$T$ hrs.
PASTURE	2000	10	4	0.129
WOODS	1000	4	2	0.179
WOODS	4000	1.9	1	<u>1.111</u>
				$\Sigma = 1.4 \text{ hrs.}$

$$L = 0.6 T_c = \underline{\underline{0.83 \text{ HRS.}}}$$

USE MOST CONSERVATIVE VALUE OF 0.26 HRS. FOR AMC II

0.19 HRS. FOR AMC III

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PILE LOW

10 - 19 "

L 141'

4.4

$K_b$        $\odot$

7

$K_f = \frac{2067.1}{2772}$

- 0.019

$$Q = a \sqrt{\frac{29H}{1 + K_c + K_b + K_{pL}}}$$

$$= 11.4 \sqrt{\frac{2(1.23)H}{1 + 0.4 + 0 + 0.014(242)}}$$

$$= 1.23 \frac{\sqrt{644} \sqrt{H}}{\sqrt{4.73}}$$

$$G = 4.54 \sqrt{H}$$

\* HEAD MEASURED 19011 19L OF 7.1 19011 19011 19011

<u>LK.LL.</u>	<u>H.</u>	<u>Q.C/S</u>
6-15	-	0
6-4.9	70	20
6549	70	25
7347	75	29
7545	44	10

WATER FLOW
$$L = \text{LENGTH OF WEIR} = 2(6') = 12'$$

C is CHARGE COEFFICIENT

$$Q = C L H^{3/2}$$

$\frac{H'}{O}$	$\frac{C}{O}$	$\frac{G}{O} \cdot 10^5$
1	3.64	44
2	3.74	127

100-443887-1000

# JENNINGS CREEK WATERSHED DAY #15

FILE BY KATING

USING THE FOLLOWING EXPRESSION FOR FLOW AT CRITICAL SPILL

$$\frac{Q_c}{T} = \frac{Q}{T} \quad (\text{KING'S HDBK. EQ. 8-19})$$

SPILLER SPILL FLOW RATE

$Q_{ps}$  = PRINCIPAL SPILL FLOW RATE

$T$  = TOTAL WIDTH OF SPILL AT WATER SURFACE

$A$  = CROSS SECTIONAL FLOW AREA

STATION	$A$ (ft <sup>2</sup> )		$T$ (ft)	$Q$ (cfs)	$Q_{ps}$ (cfs)	$\frac{Q}{T}$ (cfs/ft)	ELEV. (ft)	SPILL (ft)
	$\Delta$	COMPOSITE						
701	0	0	0	0	27	0.05	701.0	27
702	17.8	18.5	19.8	101	28	0.46	702.5	109
703	21.8	40.2	23.7	298	28	0.85	703.9	226
704	25.8	66.0	27.9	576	29	1.18	705.2	335
705	29.3	95.9	31.8	944	29	1.51	706.5	472
706	33.6	129.4	35.3	1406	30	1.83	707.8	640
707	36.1	166.0	37.8	1973	30	2.20	709.2	830
708	39.0	205.0	40.3	2622	31	2.54	710.5	1042
709	41.4	246.4	42.5	3364	31	2.92	711.9	1285
710	41.9	288.5	41.9	4289	32	3.44	713.4	1561
711	41.9	330.2	41.9	5257	32	3.94	714.9	1869

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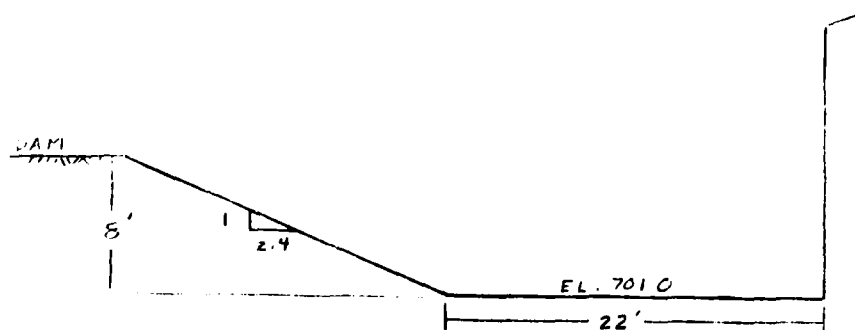
# JENNINGS CR. #15

## SPILLWAY RATING:

\* CALCULATIONS FOR CHANNEL THAT HAS BEEN GRADED TO EL. 701.0 ALONG ENTIRE WIDTH OF CRIT. SECT. & CLEARED OF ROCK DEBRIS @ LT. SIDE OF BASE.

$$\frac{Q^2}{g} = \frac{a^3}{T}$$

WATER DEPTH (ft.)	a (ft.)	T (ft.)	Q (cfs)	Qps (cfs)	$\frac{V^2}{2g}$ (ft.)	CRIT. EL. (ft.)	TOTAL (ft.)
684.5	—	—	—	0	0	684.5	—
701	0	0	0	27	3.05	701.0	1.7
702	22.9	22.9	24.1	126.6	28	702.5	55
703	25.3	48.2	26.5	368.7	28	703.7	197
704	27.7	75.3	28.9	697.6	29	705.2	727
705	30.1	106.0	31.3	1106	29	706.7	1435
706	32.5	138.5	33.7	1592	30	708.3	2427
707	34.9	173.4	36.1	2155	30	710.4	3752
708	37.3	210.7	38.5	2796	31	710.7	5347
709	39.7	250.4	40.9	3511	31	712.1	7242
710	40.9	291.3	40.9	4409	32	713.6	9441
711	40.9	332.2	40.9	5370	32	715.1	11942



THIS IS BEST QUALITY PRACTICE  
FOR A SPILLWAY OF THIS TYPE

JENNINGS CR. #15  
ELEV. VS. STORAGE CURVE

ELEV.  
(FT. MSL)

710

700

690

680

670

160

140

120

100

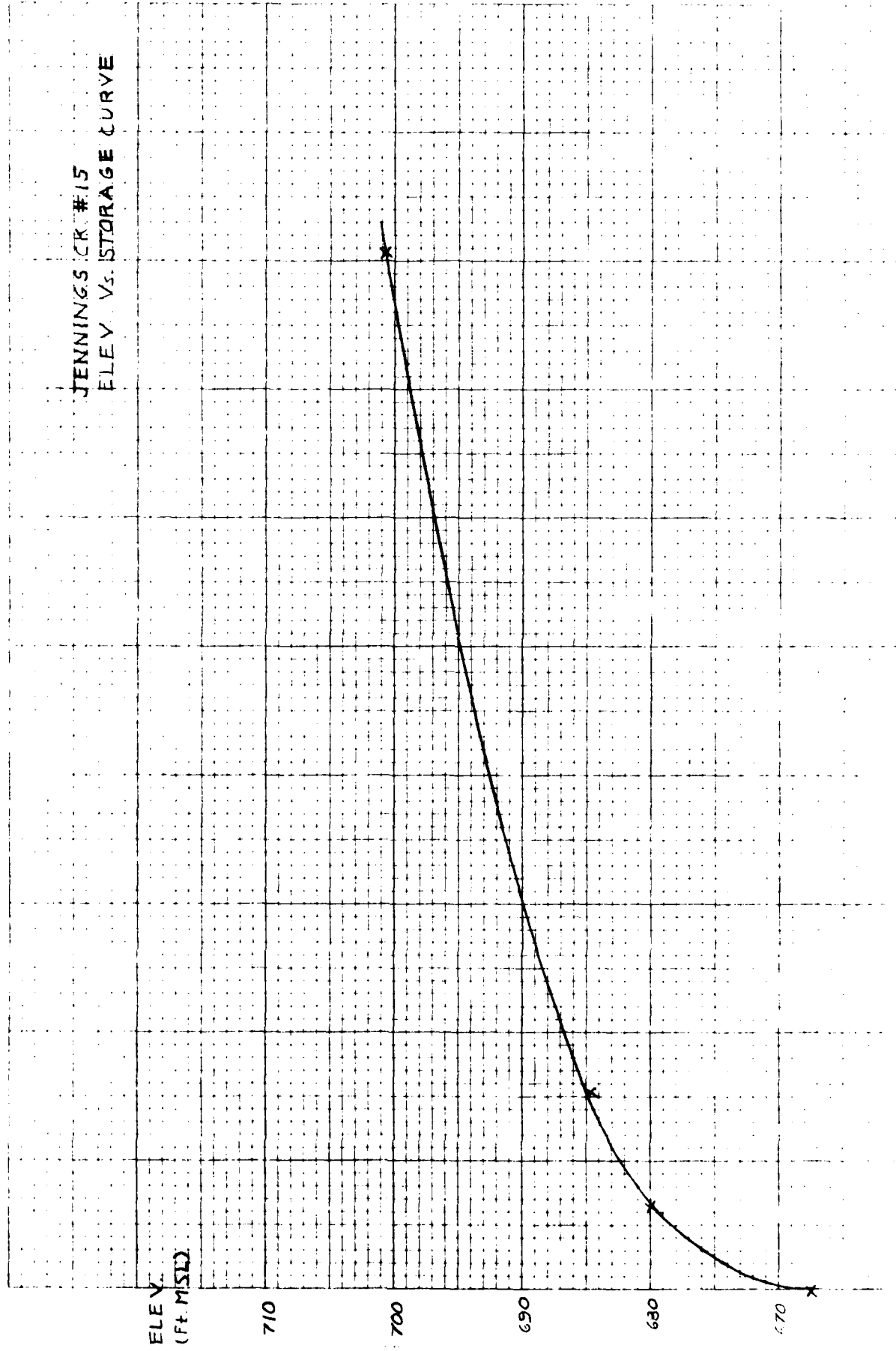
80

60

40

20

0

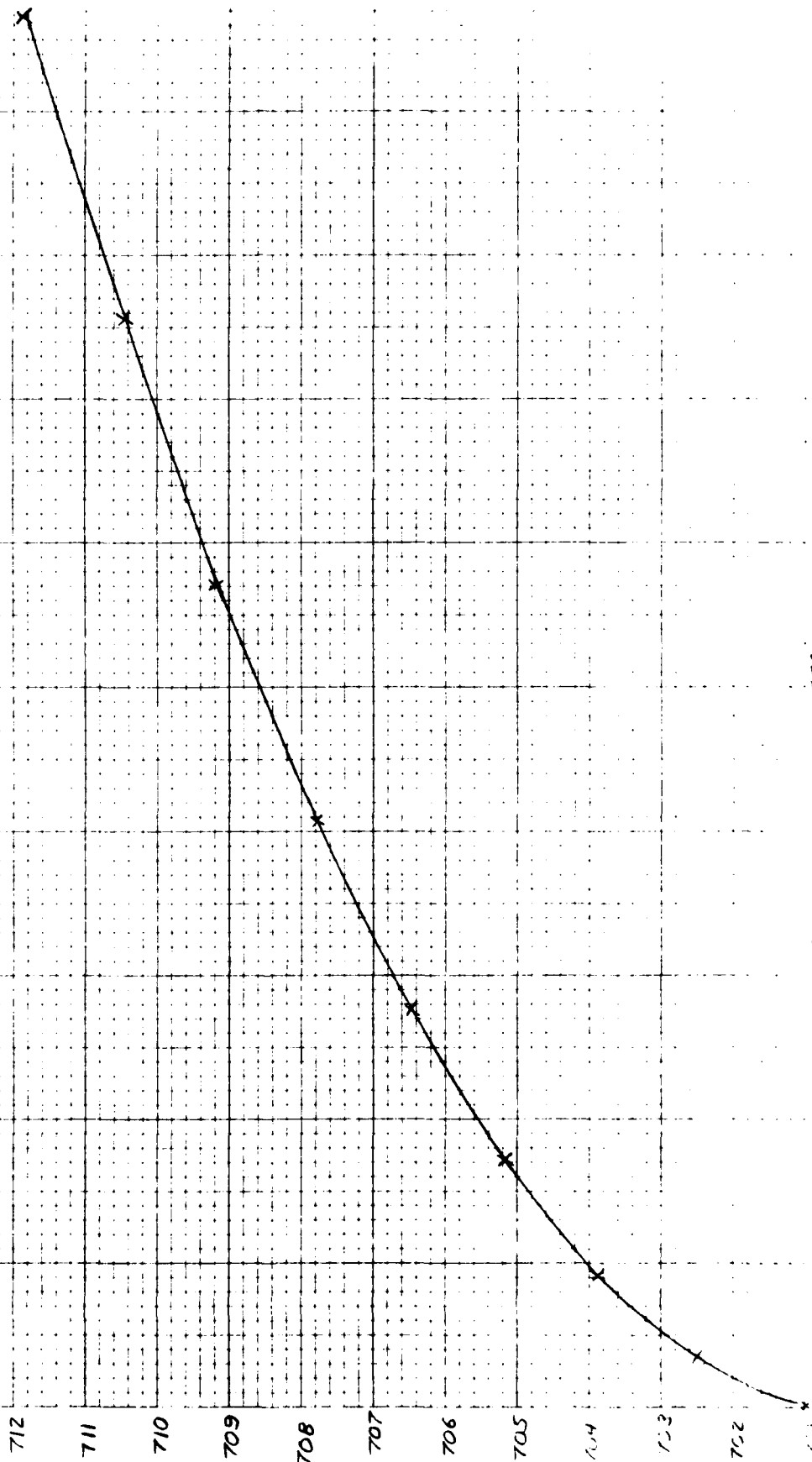


DIETZEN CORPORATION  
MADE IN U.S.A.

NO. 14-2 DIETZEN CORP. ART. 1  
1/2" X 1/2" PER INCH

COMPOSITE SPILL RATING CURVE  
FOR JENNINGS CK #15  
LK. ELEV. VS. Q

ELEV.  
(Ft. MSL)



\*\*\*\*\*  
 FLOOD HYDROGRAPH PACKAGE (MCC-1)  
 DAM SAFETY VERSION JULY 1978  
 LAST MODIFICATION 31 APR 80  
 \*\*\*\*\*

JENNINGS GREEN DAM NO 15									
JACKSON COUNTY									
AHC 11									
1	AL								
2	A2								
3	A3								
4	B	100	0	0	0	0	0	0	0
5	B1	5							
6	J	1	3	1					
7	J1	0.09	0.5	1					
8	K								
9	K1								
10	M	1	2	.760					
11	P		20.5	100	101	102			1
12	T								
13	M2		0.20						
14	X	10	100	2					
15	K	1							
16	V				1	1			
17	V1	1							
18	V4	684.5	690.5	696.5	701.0	702.5	703.9	705.2	706.5
19	V4	714.5	711.9	713.4					
20	V5	0	19	22	23	124	322	600	969
21	V5	2048	3390	4310					
22	SS	30.9	161.2	241.3	295.4				
23	SE	684.5	701.0	708.0	712.0				
24	SS	684.5							
25	SU	709.0	3.1	1.5	310				
26	K								

HYDROGRAPH COMPUTATION

-1 -73

-684.5

-1

705.2

706.5

707.6

709.2

1431

1998

[illegible]

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	720.	183.	47.	47.	11213.
CMS	21.	5.	1.	1.	318.
INCHES		2.23	2.27	2.27	2.27
MM		56.50	57.65	57.65	57.65
AC-FT		91.	93.	93.	93.
THOUS CU M		112.	114.	114.	114.

[illegible]

[illegible][illegible]







### END-OF-PERIOD HYDROGRAPH ORDINATES

[illegible]





710.9	710.4	710.1	709.4	709.5	709.4	709.3	709.2	709.2	709.1
709.1	709.0	709.0	708.9	708.7	708.6	708.5	708.4	708.3	708.3
708.2	708.0	707.7	707.2	706.7	706.2	705.7	705.3	704.9	704.6
708.4	704.1	703.9	703.7	703.6	703.4	703.3	703.2	703.0	702.9
702.4	702.7	702.7	702.6	702.5	702.4	702.4	702.3	702.2	702.2
702.1	702.1	702.0	702.0	701.9	701.9	701.8	701.8	701.7	701.7
701.4	701.6	701.6	701.5	701.5	701.5	701.5	701.4	701.4	701.4
701.3	701.3	701.3	701.3	701.3	701.2	701.2	701.2	701.2	701.2

PEAK OUTFLOW IS 7714. AT TIME 15.90 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7719.	1759.	452.	452.	108594.
CMS	219.	50.	13.	13.	3075.
INCHES		21.37	21.98	21.98	21.98
MM		542.71	558.28	558.28	558.28
AC-FT		872.	897.	897.	897.
THOUS CU M		1076.	1107.	1107.	1107.

\*\*\*\*\*

# SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

RATIO OF PMF	ELEVATION		INITIAL VALUE		SPILLWAY CREST		TOP OF DAM		TIME OF FAILURE HOURS
	RESERVOIR H.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS			
.00	695.28	0.00	116.	21.	0.00	18.60	709.00	0.00	
.50	709.91	.81	266.	3012.	.50	16.00	255.	0.00	
1.00	711.76	2.76	292.	7719.	1.80	15.90	1917.	0.00	



# SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

ELEVATION STORAGE OUTFLOW	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
684.50	684.50	684.50	709.00	0.00	18.50	0.00
31.	31.	31.	255.	.50	16.10	0.00
0.	0.	0.	2019.	1.00	15.50	0.00

RATIO OF PMF	MAXIMUM RESERVOIR U.S.ELEU	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	TIME OF FAILURE HOURS
.00	695.60	0.00	119.	15.	0.00
.50	709.93	.93	267.	2097.	0.00
1.00	712.40	3.40	301.	7599.	0.00

\*\*\*\*\*  
FLOOD HYDROGRAPH PACKAGE (HEC-1)  
DAM SAFETY VERSION JULY 1978  
LAST MODIFICATION 01 APR 80  
\*\*\*\*\*  
EOL

COGET JOB  
COMPILE JOB  
EXP 27  
(TOP OF FILE)

JENNINGS CREEK DAM NO 15  
JACKSON COUNTY  
ARC 11

\* INPUT FILE AND SUMMARY OF DAM  
SAFETY ANALYSIS WITH HYDROGRAPH  
FOR UNEVENLY SPACED TIME  
INTERVALS

HYDROGRAPH COMPUTATION	1	-1	-73
100	100	100	100
28.5	28.5	28.5	28.5
0.26	0.26	0.26	0.26
100	100	100	100
701.0	701.0	701.0	701.0
181.2	181.2	181.2	181.2
701.0	701.0	701.0	701.0
3.1	3.1	3.1	3.1
709.2	709.2	709.2	709.2
709.7	709.7	709.7	709.7
710.3	710.3	710.3	710.3
310	310	310	310
710.4	710.4	710.4	710.4
705.3	705.3	705.3	705.3
722	722	722	722
706.7	706.7	706.7	706.7
1131	1131	1131	1131
684.5	684.5	684.5	684.5
709.0	709.0	709.0	709.0
1617	1617	1617	1617
710.2	710.2	710.2	710.2
2822	2822	2822	2822
712.1	712.1	712.1	712.1
3540	3540	3540	3540





# SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....									
RATIO OF DAE	MAXIMUM RESERVOIR W-B-ELEV	ELEVATION		INITIAL VALUE		SPILLWAY CREST		TOP OF DAM	
		STORAGE OUTFLOW		684.50 ft. 0.		684.50 ft. 0.		709.00 ft. 253. 1917.	
				MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.13	701.44			0.00	166.	53.	0.00	18.30	0.00
.50	710.22			1.22	271.	1809.	.50	15.90	0.00
1.00	712.21			3.21	298.	9106.	2.20	15.80	0.00



ND-A108 258

TENNESSEE STATE DEPT OF CONSERVATION NASHVILLE DIV 0--ETC F/G 13/13  
NATIONAL PROGRAM OF INSPECTION OF NON-FEDERAL DAMS, TENNESSEE. --ETC(U)  
JUN 81 W CULBERT

DACW62-81-C-0056

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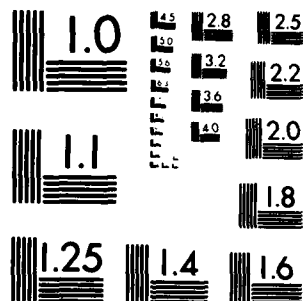
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963-A

**APPENDIX C**  
**CORRESPONDENCE**



**TENNESSEE DEPARTMENT OF CONSERVATION  
DIVISION OF WATER RESOURCES  
4721 TROUSDALE DRIVE, NASHVILLE 37220  
615/741-6860**

Certified

December 1, 1980

Mr. Jonah Sadler  
Route 1  
Red Boiling Springs, TN 37150


Dear Dam Owner:

As provided by the State Safe Dams Act, Tennessee Code Annotated, Sections 70-2501 to 70-2530, non-federal dams in Tennessee must be inspected and certified for safety by our agency. According to our records, you are identified as the owner of Jennings Ck Wtsd #15 Dam, located in Jackson County, Tennessee. Enclosed for your information and review is a copy of our inventory record on the structure along with a copy of the Act and adopted rules and regulations.

Tentative plans are to schedule a safety inspection of your dam within the next few months. A staff engineer will very shortly be in further communication with you to discuss the pending inspection and your responsibilities under the Safe Dams Act. Your immediate attention, however, is called to the matter of maintaining the earthen dam with a good grass cover and clear of all brush, undergrowth and tree growth. If these conditions do not presently exist, please make plans to remove the brush, undergrowth and all trees less than two inches in diameter as soon as possible. Larger trees may have to be removed at a later date but must be done so under the direction of an experienced engineer.

Please let me, or our Chief Engineer, Mr. Ed O'Neill, know of any assistance we might be.

Very truly yours,

  
Robert A. Hunt, P.E.  
Director, Division of Water Resources

RAH:lt

Enclosures



DEPARTMENT OF THE ARMY  
NASHVILLE DISTRICT, CORPS OF ENGINEERS  
P. O. BOX 1070  
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO


ORNED-G

NON-FEDERAL DAM INSPECTION REVIEW BOARD  
PO BOX 1070  
NASHVILLE, TENNESSEE 37202

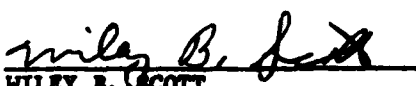
District Engineer, Nashville District  
US Army, Corps of Engineers  
PO Box 1070  
Nashville, TN 37202


1. The Interagency Review Board, appointed by the District Engineer on 8 October 1980, presents the following recommendations after meeting on 10 April 1981 to consider the Phase I investigation report on Jennings Creek Watershed Dam No. 15 inspected by the Tennessee Department of Conservation.
2. It is unclear as to the ownership of the dam and who is responsible for the operation and maintenance of the structure. This should be clarified and the owner be made aware of his responsibilities.
3. An emergency action plan should be developed, including a warning system to alert downstream residents, in the event a serious condition develops with the project.
4. An inspection during normal pool conditions should be undertaken to observe any problems not apparent with a dry reservoir.
5. The condition classification should be changed from "unsafe-nonemergency" to "significantly deficient."
6. The board is in agreement with report conclusions and recommendations following minor revisions.

  
FRANK B. COUCH  
Chief, Geotechnical Branch  
Chairman

  
EDMOND B. O'NEIL  
Alternate, Division of Water  
Resources  
State of Tennessee

  
EDWARD B. BOYD  
Hydrologic Technician  
Alternate, US Geological Survey

  
WILEY B. SCOTT  
Assistant Design Engineer  
Soil Conservation Service

  
H. F. PHILLIPS  
Chief, Hydraulics Section  
Alternate, Hydrology & Hydraulics Branch

  
BRADLEY B. ROOT  
Chief, Structural Section  
Alternate, Design Branch

END

DATE  
FILMED

1-82

DTIC